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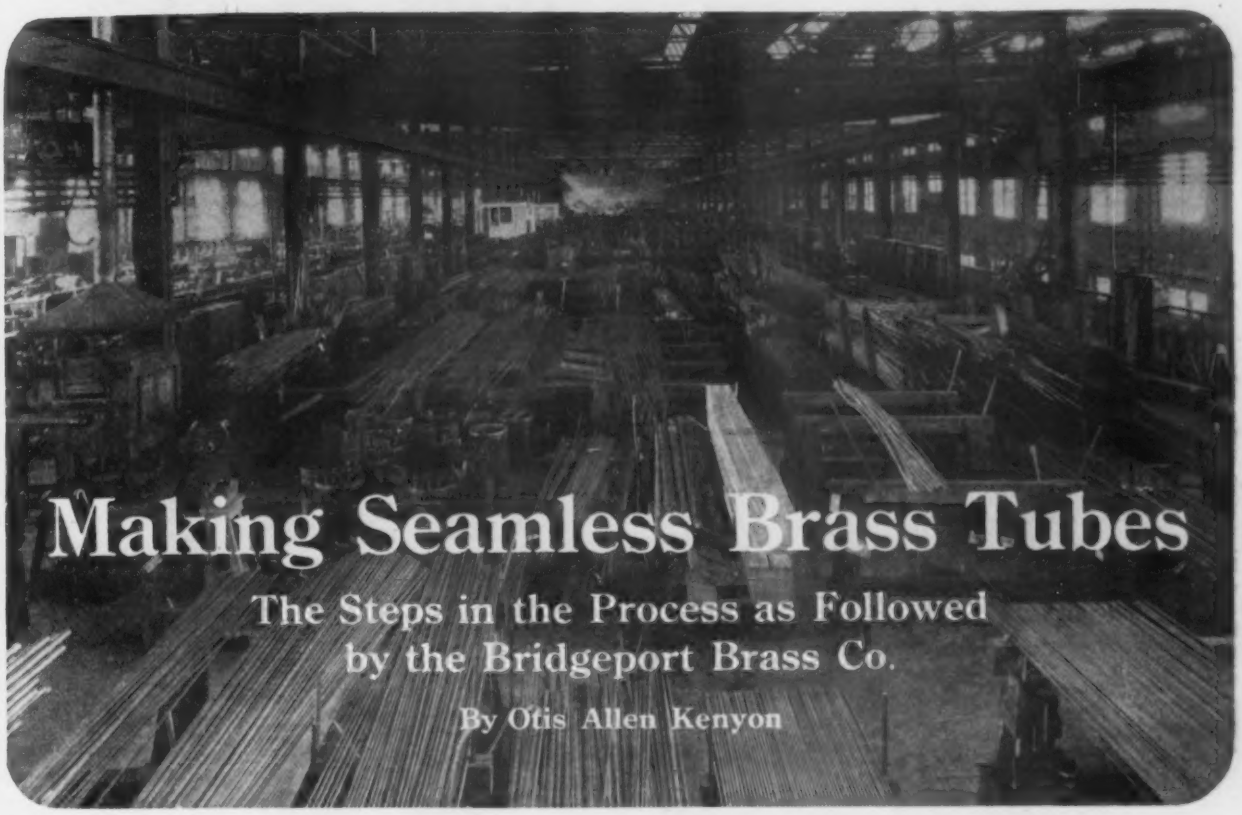


Making Seamless Brass Tubes

The Steps in the Process as Followed by the Bridgeport Brass Co.

By Otis Allen Kenyon

(Three articles on the making of brass by the same author, who is engineer of Ray D. Lillibridge, Inc., New York, appeared in the issues of Feb. 19, March 18 and March 25.)

SEVERAL different methods have been devised for making seamless brass and copper tubing and some of these have been put into extensive practical application. This article will deal with the processes employed by the Bridgeport Brass Co., which has been manufacturing seamless tubing for over 30 years. In this plant three processes of tube making are employed.

1—Piercing.
2—Cast shell.
3—Cupping.

All these processes impose extremely severe conditions on the brass maker. The quality of the metal is all important—it must be definitely known and uniformly maintained if tubes are to be made successfully on a large scale.

It is not many years ago that the quality of the output of all tube mills depended almost entirely upon the skill of a few master brass makers and tube men. As far as the drawing was concerned, it was a general practice to bring a sample of each batch to the head of the department and ask for instructions as to how much reduction should be put in the first draw and so on. There was no definite rule for determining the number of reductions or the percentage reduction. As a matter of fact, investigation showed that the reduction of area was a matter of the wildest guesswork, even with the most expert tube makers.

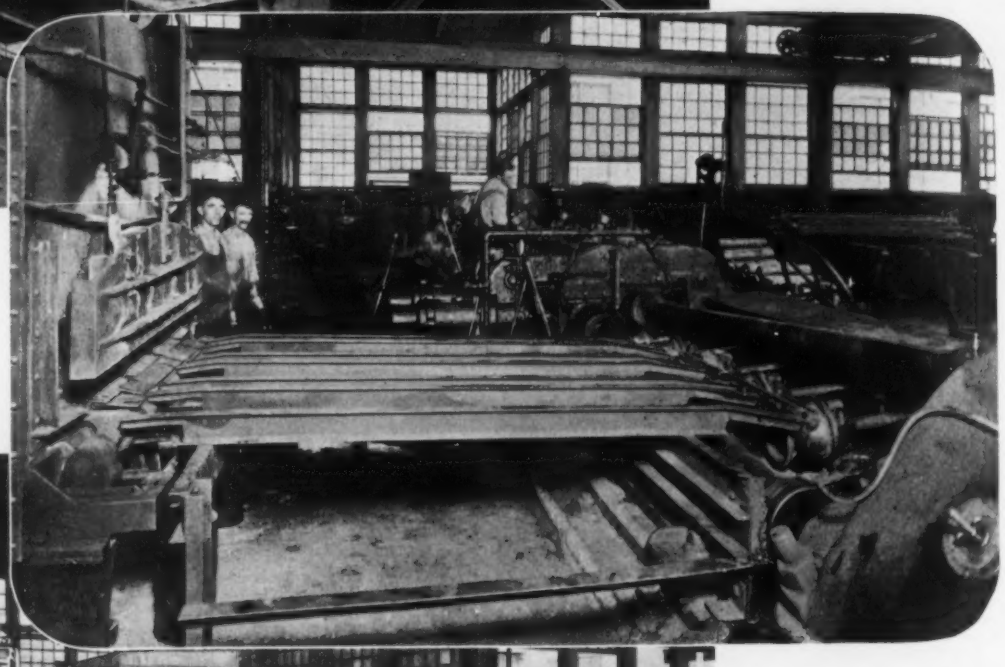
The Bridgeport Brass Co., Bridgeport, Conn., considered and tackled this problem by setting up an experimental plant some 15 years ago, and in connection with the laboratory studied every phase of the tube making problem. In the operation of this plant, they used as far as possible men from their own shops, so that they would get the most practical benefit from the experiments. As a result of the operation of this experimental plant, tube making machinery was developed, and the equipment of the present tube mill, which is one of the largest in the country, is special, having been designed and built as a result of development work done in the experimental plant.

As far as the various operations are concerned, each one has been definitely determined and specified, and it is no longer necessary to perform any one of the many operations by guesswork or in accordance with the judgment of the man in charge. As far as drawing is concerned, graphical charts have been prepared which enable the foreman to determine the proper reduction for any tube of a given diameter and wall thickness.

Piercing Process

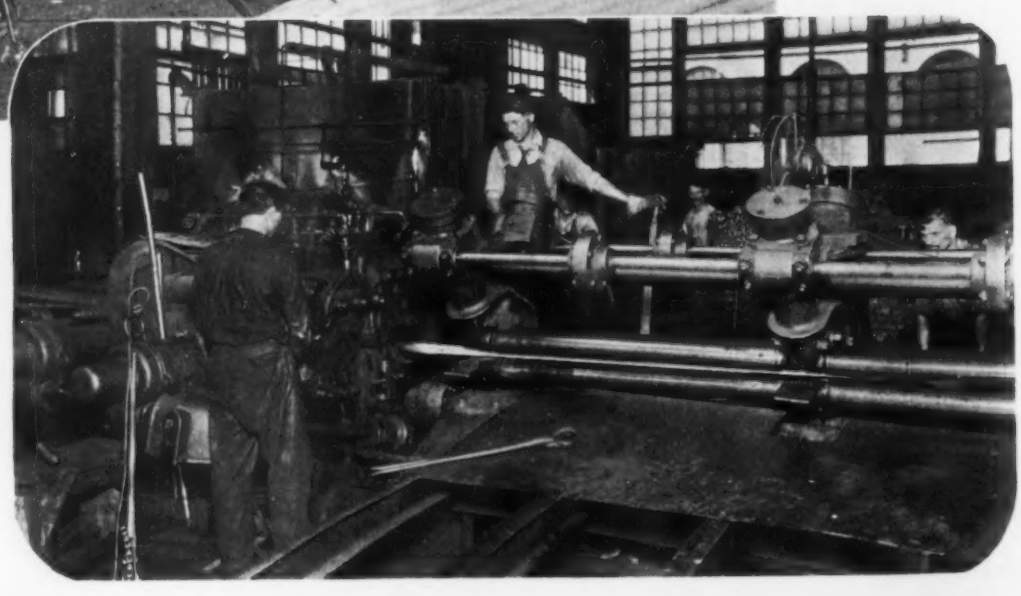
Solid cast billets from the electric casting shop are first turned in a lathe to remove surface impurities and mechanical imperfections, which reduces the chances of imperfections in the surface of the

The Billets Before Being Charged Into the Heating Furnace Are Cupped at One End to Facilitate Piercing Operation

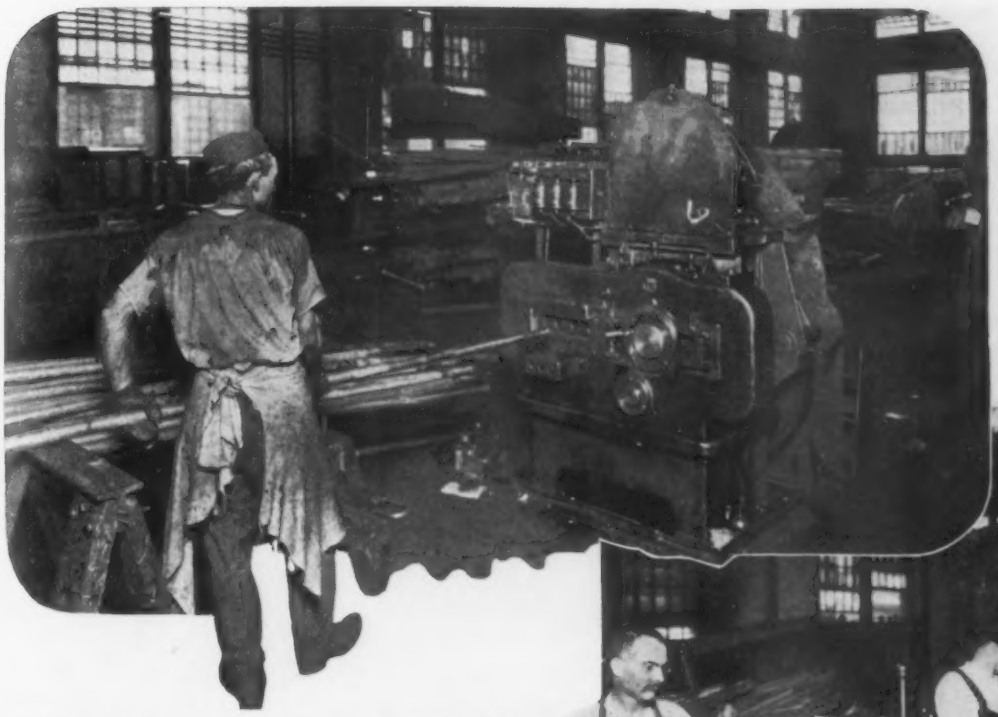


The Heated Billets Roll Out of the Furnace Into the Intake of the Piercing Machine

The Operator by Means of Levers and Electric Master Switches Controls the Operations of Rolling the Tubes



Three Conical Rolls Force the Billet Against the Centrally Supported Projectile Shaped Piercing Point



Before Reducing the Tube Diameter by Drawing, an End Must Be Hammered or Pointed to a Diameter Small Enough to Reach Through the Die to the Jaws of the Drawing Head

finished tube. After being turned, the billets are delivered to the piercing mill heating furnace, where they are gradually brought up to the proper temperature for piercing.

In the view showing the billets entering the heating furnace, it will be noted that they are cupped on one end. The cupping facilitates the centering of the piercing point. When heated to the proper temperature, the billet is rolled out of the furnace into the intake of the piercing machine. In another of the illustrations a billet may be seen lying on the feed rollers of the machine. The operator standing in the center of the piercing machine, by means of levers and electric master switches has all functions of the machine under his control.

The piercing machine consists of three conical rolls, two of which are power driven, the third one being an idler. The two power driven rolls are visible in this same picture; the drive is located at the extreme right of the picture and is transmitted through the long shanks to the rolls in the main body of the machine. These rolls, including the idler, make a definite small angle with the center line of the billet, and the points of contact with the billet of all three rolls travel on the same spiral so that they exert a certain amount of squeeze and draw the billet through with great power.

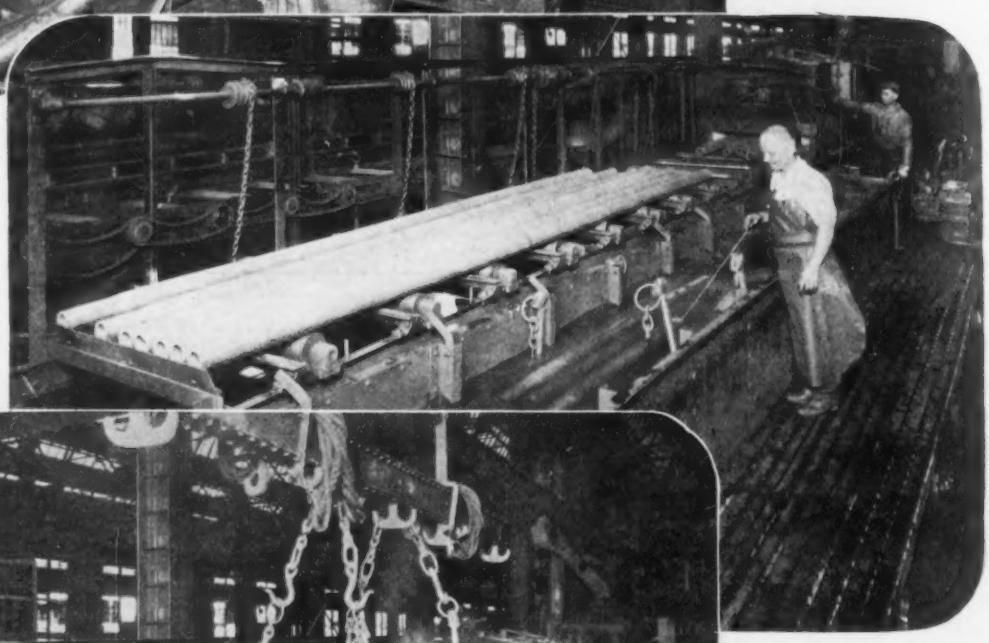
On the center line of the billet at the exit end of the rolls is located the piercing point which is shaped like a projectile. This point is carried on a rod somewhat longer than the longest tube within the capacity of the machine. A series of guide rolls and loose sleeves support the rod to prevent springing by the end pressure on the point. A tool head on the opposite end carries the rod and allows it to turn continually as actuated by the friction of the billet.

The tool head is mounted on a bed and so arranged that when the finished tube is forced entirely over the point and the rod, the rod can be withdrawn from the tube by causing the tool head to travel backward. The electrical control of this machine is quite interesting, as it involves a number of distinct motions.

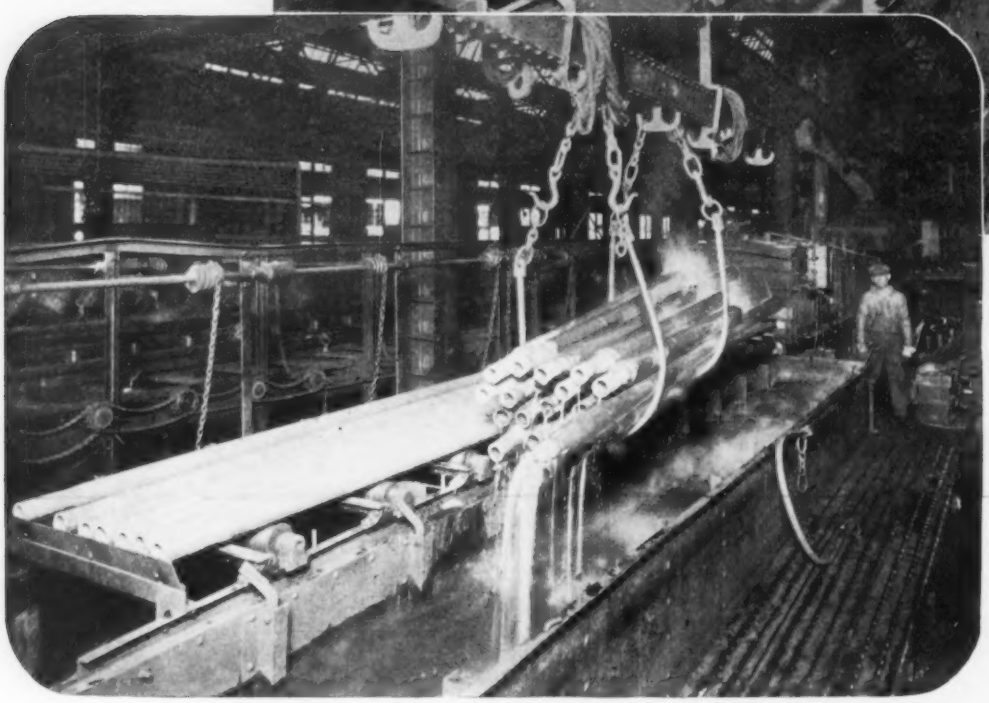
A view taken from one side of the machine is also shown. At the left in this may be seen a portion of the part of the machine which carries the rolls; one of the piercing points is lying on a box in front of the machine at the left. The central portion of the picture shows that part of the machine which guides and supports the piercing rod and the tube. As may be seen, the guiding members consist of three sets of three rolls each arranged in triangular formation. They rotate by friction with the tube and may be adjusted by means of gearing to correspond to any diameter of tube within the capacity of the machine. At the extreme right of this picture the tool head which carries the piercing rod may be seen. The tube is shown issuing from the machine. When the complete tube has passed through the machine, the hydraulic pistons raise the upper guide rolls and discharge the tube toward the front. A number of finished tubes may be seen in the foreground of the picture.

Another view in the group shows that part of the machine which carries the rolls. A billet is just starting through and the point is in position to force its way through. The heating furnace is visible in the background. The operation of this machine requires considerable training and experience, and in order to follow the process it is necessary for the operator to be located where he can see the rolls and the tube issuing from them. The watching of all the operations and manipulation of

The Draw Benches Are Operated by Hydraulic Plungers and Different Stages of Drawing Are Here Shown



Annealing Is Done in Continuous Furnaces and at the Exit Side the Tubes Are Dumped Into a Pickling Tank



After Pickling, Which Removes Dirt and Grease, the Tubes Are Hoisted for Successive Drawing and Annealing Operations

the various levers, valves and switches, keeps the man pretty busy.

After the billet has been pierced and formed into a rough tube, it is delivered to the drawing department where it is put through the draw benches in exactly the same way as the cast tubes are put through.

In the cast shell process the metal is cast in the form of a hollow cylinder, and delivered to the drawing department. The drawing department where are located the annealing furnaces, the draw benches and the finishing machines is known as the tube mill, a general view of which is given at the head of this article.

Drawing Process

Before tubing can be drawn, the end must be reduced in size so that it can be passed through the die and inserted into the clutch jaws of the drawing head.

The pointing machine operates like a hammer, pounding the ends of the tube into an approximately circular form of smaller diameter than the body of the tube. The hammer consists of a block with semi-circular openings in the bottom which register with corresponding openings in the anvil. There is a series of these openings of decreasing diameter, and the tube is first inserted in one and then in the other, being turned the meanwhile. A horizontal type of pointing machine for smaller sizes of tube is also shown.

Several types of draw bench are used in the process of tube drawing, but the fundamental principle of drawing is the same in all. The great problem in the process, assuming that the metal is properly made and the reduction of area for each

operation properly chosen, is in the design, workmanship and material of the dies, and the character of the lubricant employed. The Bridgeport Brass Co. maintains an oil laboratory where research work is done. It prepares all its own lubricants in accordance with its own formulas and controls by check-tests the quality of the product at all times.

A group of draw benches which are operated by hydraulic plungers is shown among the illustrations. The pointed end of the tube is inserted through the die and gripped by the clamp, a plug or triblet is inserted inside of the tube and anchored at a definite point with relation to the die by a rod as indicated. A bushing which serves as a bearing and guide for the rod may be seen in the outer end of the tube on the bench at the right, and the next bench at the left shows plainly the plug at the end of the rod. Tubes ready to be drawn are dropped by a crane on an inclined support alongside of the intake end of the bench. After drawing, the tubes are discharged to the left on the exit end of the machine, from where they are picked up by a crane and carried to the annealing furnaces.

Annealing

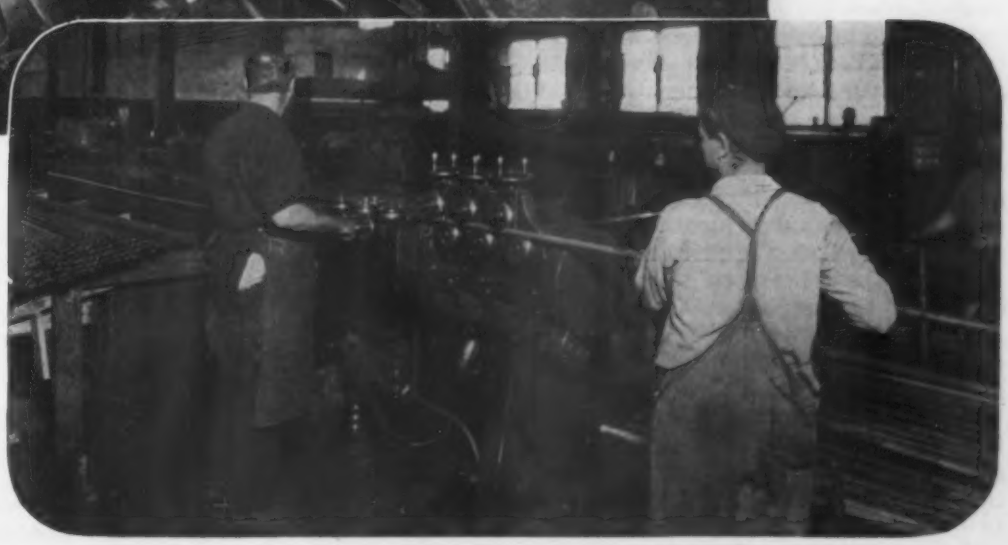
Annealing is one of the most important operations in the manufacture of tubes, because of its effect upon the drawing strains and the physical properties of the tube. Experimental studies have shown that proper annealing will eliminate practically all drawing strains, and yet not reduce the strength and other desirable properties of the tubes. This result is obtained by establishing a proper balance between maximum temperature and period of heating and maintaining it. To insure these conditions on a production basis, the annealing is done in a continuous furnace, the tubes being carried through a constant temperature chamber at a definite rate. One of the reproduced photographs shows a batch of tubes that have just completed the anneal and a second batch issuing from the furnace.

The pickle, the purpose of which is to clean the tubes of all grease and dirt, is located at the exit side of the annealing furnace where the tubes are dumped by a tipping mechanism as there shown. After the pickling operation is complete the tubes are hoisted out of the pickle and returned to the draw benches for the next operation.

Drawing and annealing the tubes causes a certain amount of distortion due to unbalanced stresses. This is overcome by passing the tubes through a combined springing and straightening machine after the last drawing operation. In this machine each tube is passed through spiral rolls which spring it in such a way as to equalize the strains and straighten it. The small tubes such as used in condenser work are sprung and straightened by the action of two series of rolls, one in the vertical plane and the other in the horizontal plane.

The operation of the tube mill as a whole is carefully worked out and controlled to produce tubes that have the least possible amount of strain in their make-up, so as to avoid what is known as

To Overcome Distortion in the Drawing and Annealing, the Tubes Finally Are Passed Through a Combined Springing and Straightening Machine. Each tube is passed through spiral rolls



Small Tubes Are Sprung and Straightened by the Action of Two Series of Rolls, One in a Vertical and the Other in a Horizontal Plane

The Tubes Are Cut to Desired Lengths by a Swinging Circular Saw. Then they are subject, as shown in the view below, to Hydraulic Pressure

For Laboratory Tests an Inspector Cuts Off Samples—the View at the Bottom of the Group

"season cracking," and the peculiar corrosion which puzzled brass makers and engineers so long, until it was definitely proved that such corrosion was brought about by unequal strains.

According to Dr. Paul D. Merica, brass, which is a non-homogeneous alloy and usually contains two classes of crystals, is subjected to local differences in electrolytic potential. These potentials are increased by the presence of strains in the metal. The effect of corrosion on the surface of the metal is to produce a series of very fine ridges, and the combined effect of the strains and the intensified electrolytic action is to deepen the hollows, because whatever original strain was in the surface is multiplied from two to five times in the hollows and reduced practically to zero on the high points. Therefore, cracks are opened up in a relatively short time depending upon the amount of original strain and the intensity of the electrolytic action.

The straightened tubes are complete as far as the manufacturing process is concerned—all that remains is to put them into condition for shipment and pass them through adequate inspection. After straightening, the first operation is to cut them to definite lengths, which is done with a swinging circular saw where, as shown in one of the cuts, two men are cutting up condenser tubing. The cut tubing is next subjected to hydraulic pressure in order to discover any possible flaws or weak spots. An hydraulic testing bench in operation is shown. The man at the left controls the application of the pressure. An inspector then cuts off samples for laboratory tests. It is the practice of the Bridgeport Brass Co. to make such tests on a definite percentage of the product, so as to control the quality. After the hydraulic test, each tube is subjected to close inspection for dimensions and general appearance, before it is packed for shipment.

Although the bulk of the output of the tube mill is circular in section, a large variety of special shapes or sections are drawn. While most of the tubes and special sections are sold as raw material to manufacturers, a portion of the production is utilized in the manufacturing department of the company principally for making tubular plumbing connections and supplies, such as straps, bath room fixtures, etc.

Gets Big Bar Mill Order

The Morgan Construction Co., Worcester, Mass., has a contract to install a 12-in. merchant bar mill at Plant B, United Alloy Steel Corporation, Canton, Ohio, to cost, with full equipment, approximately $1,250,000. This mill will be served by a 16-in. roughing mill, the two having a monthly capacity of 10,000 tons of bars, angles, tees, flats, etc.

The equipment for the new mill will include heating furnaces, gas producers, cooling beds, shears and the other usual auxiliary equipment, a 3000-h.p. motor and four 10-ton cranes; the Alliance Machine Co., Alliance, Ohio, having these contracts. The units will be enclosed in an all-steel building to be erected by the American Bridge Co., New York. The new mill should be in operation by July, 1921.

The Morgan company has 16 mills under construction, six of which are for the United States, six for France and four for England. The company is taking on extra mechanical laborers and is to increase its draftsman force from 70 to 100. During the past month the company has placed orders for considerable heavy duty machine tool equipment.

MANY FURNACES BANKED

Strike of Railroad Employees in Youngstown District Curtails Production

YOUNGSTOWN, OHIO, April 12.—Iron and steel production was reduced almost to negligible proportions in the Mahoning, Shenango and Beaver Valleys at end of the week by the unwarranted strike of yardmen and switchmen. Fifteen of the 25 blast furnaces in the Mahoning Valley were banked when the plants closed for the week on April 10, and open-hearth furnace and finishing operations were largely paralyzed. The strike of a minority of the railroaders, preventing others from working and producing an enforced layoff, was similar in many respects to the drastic strike in the steel industry last fall, in that the men arbitrarily quit without making any complaints or presenting any demands.

That the action was unpopular is indicated by the unfavorable comment on the part of many workers adversely affected thereby. The complete and sudden reaction upon industrial operations and the injury effected upon the public, lead many thoughtful men to conclude that the strike must be outlawed by adequate legislation as a means whereby one class is enabled to enforce its ruthless will, to the utter disregard of the rights of the public.

Proposed Prosecution of Leaders.

In the Youngstown and Pittsburgh districts, the determination of W. G. Lee, chief of the Brotherhood of Railway Trainmen and of John G. Cooper, congressman from the nineteenth Ohio district, embracing the "steel belt," to push prosecution of leaders of the outlaw strike under the Lever act, struck a responsive chord. Mr. Cooper is a member of the Brotherhood of Locomotive Engineers and was formerly and for many years a locomotive driver for the Pennsylvania Railroad.

The walkout temporarily dislocated industry and affected 85 per cent of the steel workers in the Youngstown district.

Through selected committees strikers presented wage demands to division superintendents April 10, asking for $1.50 an hour for engineers, $1 for firemen and yard conductors, 95 cents for yard switchmen and 75 cents for yard clerks. Wages paid by carriers in this district are—yard engineers, 72 to 74 cents an hour; yard firemen, 53½ to 55 cents; yard conductors, 66¾ cents; yard switchmen, 62½ cents.

Mass meetings of strikers were liberally attended. The recalcitrant railroaders attempted to justify their action by declaring that the strike was only resorted to as a last weapon. "Our leaders assumed authority we never knowingly gave them," they declared in a formal statement, "and agreed to abide by the decision of the Cummins-Esch bill and we even then would have waited a reasonable time, but the president and our leaders decided to drag the wage question through another political campaign and the board which was to adjust our wages is not yet appointed, and we do not believe justice will be done. Consequently the only thing we could do as Americans who feel it our paramount duty above all other things to raise families according to a decent standard was to strike against the conspiracy of a small group of politicians and disinterested labor leaders. We have followed our leaders and the Government officials through the difficult stages of the war, kept up by promise that justice would be done us. When shipbuilders, coal miners and other essential occupations demanded better wages and enforced their demands by striking regardless of the conditions which existed at that time, we, to show our patriotism and to help win the war, stayed at work and almost at starvation wages."

Manager Baldwin's Statement

W. A. Baldwin, manager of the Ohio region of the Erie Railroad, with concurrence of district managers of other roads, informed committees claiming to represent the strikers that he could not deal with them, and said their action further increased the danger to organized labor in America of the radicals within its ranks who are constantly fomenting strife. He said—"All yardmen have left their work in this territory before presenting any demands or formulating any grievances. Their action appears to be against their old established organization rather than against the railroad companies. Most of these men are old and faithful employees who have heretofore been good citizens of the community and who have helped in no small degree toward its development. Their intelligence should indicate to them that their present action is unwise and will bring no favorable results to them, and is bound to bring unnecessary hardship and suffering on their neighbors and fellow citizens.

"Railroads have contracts governing the working conditions and rates of pay of men in yard service. The contracts were executed with representatives of the men who were elected by them. We have no moral right to violate the contracts by changing the conditions or rates of pay without the general consent of the representatives of all the men of the Erie Railroad. We have no legal right under the new railroad act to change the rates of pay or working conditions for a period of six months, this matter being handled by means of authorized committees representing all interests. We are, therefore, not in a position to deal with any new organization or to consider its demands so long as it remain out of our service.

"We hope that in a short time the wise counsel of our more experienced men will prevail and the men will return to work with confidence that their interests will be properly cared for by the duly authorized machinery. Meanwhile their actions here and elsewhere are doing great damage to the interests of their organizations and organized labor in general, as the public cannot but appreciate that if members of the oldest and most dependable of labor organizations, namely, the railroad brotherhoods, are not willing to abide by their contracts, there is little that can be expected of organized labor in the future.

No Occasion for Strikes

"The recognized leaders and representatives of men in train service have declared that no occasion for strike exists and that none has been legally authorized. Men will be hired to fill the places vacated as fast as those of suitable qualifications present themselves."

Prior to this disturbance conditions in the steel industry were rapidly stabilizing. Only two of 25 blast furnaces in the Mahoning Valley were idle, one of which has been down for a year and a half, and coal and coke supplies were approaching normal again. The Youngstown Sheet & Tube Co. had five of its six stacks in blast and was preparing to light the sixth at Hubbard. Five of its six batteries of by-product coke ovens were producing coke, while 431 of 533 by-product ovens in the Valley were active. It is estimated, however, that 5000 men were idle half of March because of inadequate car supplies in this territory. There was little diminution at the end of the week in the piled tonnage of finished output, which approximated 140,000 tons.

Very Few Sales

Sheet mills, which consume a small amount of fuel in comparison with the steel plants, will fare better from the operating and production standpoint than any other units. Despite this fact, though, output will be more or less limited, which means that makers will be more restricted than ever in considering new business. Practically the only sales in the past 10 days have been resales, negotiated through brokers, where the buyer wanted urgent delivery. It is certain there will be a large carry-over of rollings from the second to the third quarter. In the past two weeks there has been a noticeable decline in inquiries for heavy tonnages of finished steel of all grades, for which reasonably prompt delivery was expected.

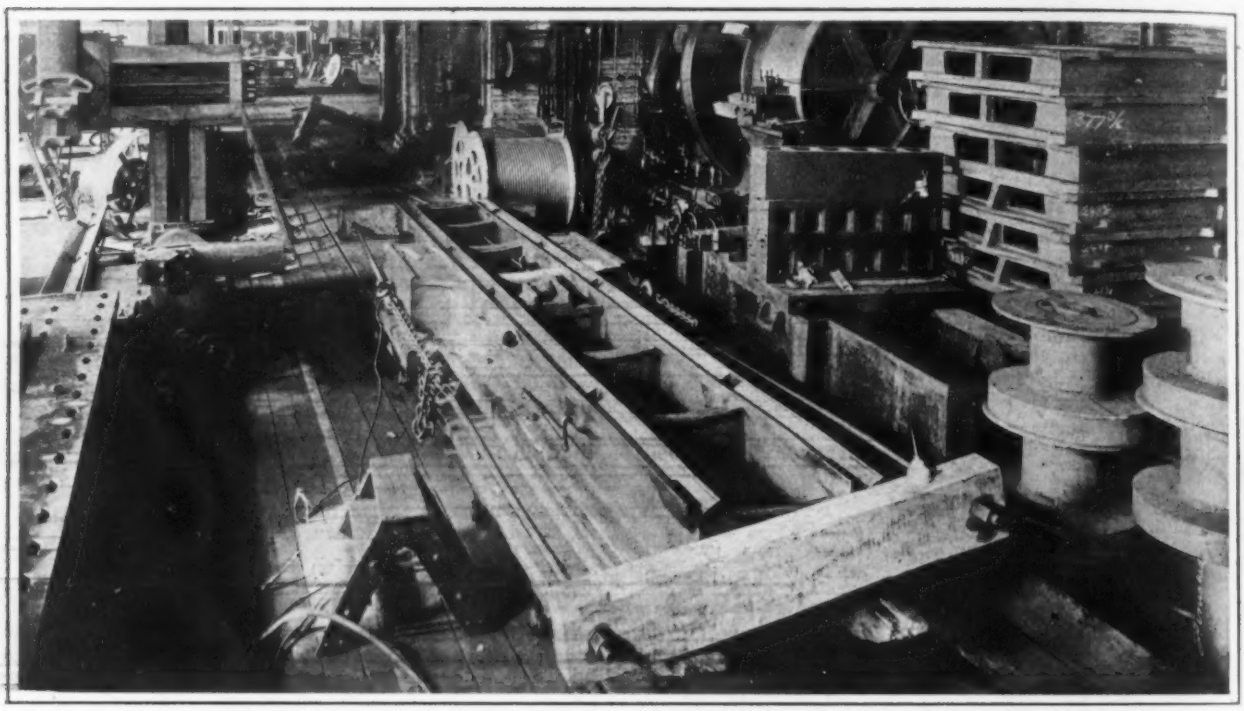
Fire recently did about $25,000 damage in the core department, Eastern Malleable Iron Co., Naugatuck, Conn., branch.

Cast-Iron Planer Bed Electrically Welded

Cast iron offers many difficulties to the welder and some of the difficulties are incident to the design of the parts welded rather than to the cast iron itself. The welding of the planer bed shown in the accompanying illustration is interesting on account of the fact that the weld had to be made without appreciable distortion of the parts, and the joint had to be finished so that the weld could not be readily detected.

The planer bed was 20 ft. long, weighed approximately 12 tons, and was part of a 60 x 60-in. planer. It was broken into two parts approximately in the middle. The line of the break was 84 in. and the welding was done from both the inside and the outside, making an external welding line of 168 in.

In doing this work it was first necessary to assemble the parts in exact alignment and position. This



A Break 84 In. in Length Was Electrically Welded in This Cast-Iron Planer Bed Without Appreciable Distortion. The parts were drawn together with screws in a large clamp

was done by setting up two long inverted V's and laying the planer bed upside-down on these V's, then the parts were drawn together with screws in a large clamp. Having cut out the joint with air tools the welding was done according to usual practice, using a steel pencil and special steel reinforcing plates. When finished the exterior surface was ground flush with that of the original casting. Chalk was put on for the purpose of photographing.

The absence of distortion after welding, it is stated, was evidenced by the fact that the ways were in perfect alignment when the job was completed; and a spiral gear with its bearings, located in the middle right adjacent to the weld, was also in perfect alignmnt.

The strength was tested at two different times, first when the welding was about two-thirds done it was necessary to turn over the bed. This was accomplished by putting a sling around the middle at the weld and hoisting, which put the maximum strain of the weight of the bed on the weld. During the operation of turning over, the bed was dropped some 3 or 4 in. on the floor and was bumped around considerably, all of which put excessive strains on the partially completed weld, and yet there was no sign of weakness. The work was done for the Lidgerwood Mfg. Co. by the Electric Welding Co. of America, Brooklyn, N. Y.

For accommodation of its workers the Struthers Furnace Co., Cleveland, will erect a pressed brick building to house locker and washrooms, at its plant in Struthers, Mahoning county. It will have facilities for 160 men.

Metal Trades Meeting Next Week

Shop representation bids fair to come in for conspicuous attention at the annual meeting of the National Metal Trades Association, Wednesday and Thursday, April 21 and 22, at the Hotel Astor. Five addresses on the question, "What Is Shop Representation?" are scheduled for the morning session of Thursday and a general discussion is to follow. These addresses are to be given by the following: A. M. Young, International Harvester Co., Chicago; L. R. Clausen, Deere & Co., Moline, Ill.; C. S. Ching, United States Rubber Co., New York; Robert E. Newcomb, Deane Steam Pump Co., a subsidiary of the Worthington Pump & Machinery Co., Holyoke, Mass., and R. G. A. Phillips, American Multigraph Co., Cleveland.

At the Thursday afternoon session an analysis of the report of the President's industrial conference by Walter Drew, National Erectors Association, New York, is announced. At this session, which is the last, will be given the various convention committee reports, and officers for the ensuing year will be elected.

The first session of the meeting proper, following the gathering on Tuesday of the members of the administrative council of the association, will be held on Wednesday morning, April 21, 9.30 a. m. The reports of the officers form the main part of the program and will be made by President John W. O'Leary, Treasurer Frank C. Caldwell, Commissioner John D. Hibbard and Secretary Homer D. Sayre. At this session a report of the committee on industrial education is to be made by Harold C. Smith, chairman, and by Philip C. Molter, superintendent department of industrial education.

At the session on Wednesday afternoon, 2 p. m., the program includes the following addresses: "The Closed Shop Press," by E. N. McCone, general manager *Buffalo Commercial*, Buffalo, and "Immigration and Labor," by Dr. Richard H. Waldo, Inter-Racial Council, New York. Addresses are to be made by Samuel O. Dunn, editor *Railway Age*, Chicago, and George E. Roberts, National City Bank, New York.

The banquet will be held as usual on Wednesday evening.

Journeymen sheet metal workers at Youngstown, Ohio, have signed an agreement with the Master Sheet Metal Workers' Association for a rate of $1.12 per hour, an increase of 22½c. over the 1919-20 scale. The new contract will extend for one year from May 1.

British and French War Effort in Steel

Shell Steel One-third the Total in Great Britain—Large Use of Scrap —The Policy of Government Subsidies

(*Special Correspondence*)

LONDON, March 17.—A paper on "The Iron and Steel Trades During the War," was read before the Royal Statistical Society in London on March 16 by M. S. Birkett, O.B.E., who is the statistical officer of the National Federation of Iron and Steel Manufacturers. It contains much valuable information regarding the developments of the industry during the war and gives a good idea of the present position from the standpoint of ability to meet international competition. Some particulars are also given concerning the iron and steel trades of the United States and France. An abstract is presented below:

Great Britain's Decline and Partial Recovery

It is well known that before the war Great Britain had been ousted from the premier position in the production of iron and steel, and occupied only the third place, the first and second places being occupied respectively by the United States and Germany. From having contributed 52 per cent of the world's production of pig iron in the quinquennium 1871-1875, as against the United States' 18 per cent and Germany's 15 per cent, Great Britain's proportion had fallen to 21.8 per cent in the quinquennium 1901-1905, compared with the United States' 45.5 per cent and Germany's 23.2 per cent. By 1913 Great Britain contributed only 14 per cent of the total to 40 per cent by the United States and 25 per cent by Germany. Nearly half the production of pig iron was made from imported ores, which was rendered possible by the existence near the seaports of large coal fields. Although in certain lines Great Britain had lost her former supremacy (for instance, her share of the total world's export trade in rails dropped from 72 per cent in 1884 to 32 per cent in 1913), she was still nearly the largest exporter of iron and steel in the world the 1913 figures being for Great Britain 5,049,000 tons, Germany 5,664,000 tons and the United States 2,746,000 tons. Her tin plate trade, although very hard hit by the McKinley tariff of 1891, which caused her exports of tin plates to fall gradually from 448,000 tons in 1891 to 251,000 tons in 1898, managed to weather the storm, and subsequently made a remarkable recovery, so that by 1913 the exports amounted to 494,000 tons, and in addition a huge export trade in galvanized sheets had been built up, amounting in 1913 to 762,000 tons.

As in most industries so in iron and steel the year 1913 was a boom year. The output of pig iron attained 10,260,000 tons—a figure never reached either before or since—while the production of steel ingots and castings amounted to 7,664,000 tons, a figure higher by 867,000 tons than that of the year before, which was the previous best, though one which later was considerably exceeded as the result of the efforts of the steel production department of the Ministry of Munitions. Prices, too, were good; to quote only two examples, the ascertained price of Cleveland pig iron averaged £3 per ton, the highest figure recorded since 1900 (when it was £3 8s 1d.) and steel plates £7 2s 7d, again the highest since 1900, when it was £7 19s. Exports of iron and steel and manufactures thereof reached the record figures of 5,049,000 tons.

Early War Period

There was evidence towards the end of the year, however, that the period of prosperity was passing and giving place to a period of comparative depression. At the outbreak of war this general downward tendency for a time was accentuated, for although German competition had been eliminated the large export trade was severely handicapped and the home trade uncertain. No one realized that the war was likely to last so long, and certainly steel makers did not realize how much the result would ultimately depend upon the steel resources of the country. In the autumn Government and Allied orders began to come forward in large quantities, a big home trade soon developed, and the efficient work of the British navy enabled foreign trade slowly to improve. The scarcity of tonnage which was felt towards the end of the year led to big orders for shipbuilding material being placed so that at the close of the year not only were the works extremely busy, but they were beginning to feel the shortage of labor due to the enlistment of so many men for the army, and representations were made to the Government that the supply of munitions would suffer if further recruiting from steel works took place.

Shell Steel

The first problem was obviously shell steel. Before the war only six firms had experience of this kind of steel and the specifications were rather severe. The steel department early set about standardizing the various sections for each caliber of shell and fixing a standard weight for each mark. As the demand for shells and consequently for steel increased, the specifications had to be made less strict. Makers who had been accustomed to make shell steel prior to the war placed their experience at the disposal of other makers and the number of firms making shell steel rose from six to 60, and the production of shell steel increased as shown in the following table, in gross tons:

	Average Weekly		Average Weekly
1915, 4th quarter....	20,300	1916, 4th quarter....	35,000
1916, 1st quarter....	28,500	1917, 1st quarter....	35,600
1916, 2nd quarter....	34,500	1917, 2nd quarter....	36,300
1916, 3rd quarter....	34,000		

At one time nearly a third of the ingot output of the country was going into shell steel, but even this was insufficient for the huge shell program, and shell steel had to be imported from America and Canada.

After the second quarter of 1917 the increasing demand for ships and other munitions made it necessary to reduce the output of shell steel, and to rely to a greater extent on the United States and on the stocks of finished shell, forgings and shell steel, which had by this time been accumulated. Incidentally, it may be remarked that the insistence on a specially high quality of steel for the manufacture of shells has led to a great improvement in the quality of steel manufactured throughout the country. The proportion of the rejections in American shell steel was much higher than that of the British steel makers.

Much Scrap Used

One of the interesting features was the increased use of scrap. The shortage of pig iron made it necessary that scrap should be used to a greater extent than hitherto, and it was suggested to the steel makers that 50 per cent of their charge might be of scrap iron or steel. No precise information is available as to the proportions of scrap used before the war, but it is generally considered that on the average it did not exceed 30 per cent of the charge and was often much lower. To insure that scrap should be used to a greater extent, steel makers were requested to render monthly statements showing the proportions of scrap used during the month. These returns were critically examined, and where the proportion was low the firm was requested to use a higher proportion. When the first returns were received the average proportion of scrap used was shown to be about 34 per cent. This proportion was gradually increased until a percentage of 47 was reached, an equivalent saving of 750 tons of pig iron for the same ingot output. Such a high

proportion was rendered possible by the accumulations of steel turnings from the shell shops; in fact, steel makers were at first unable to absorb such large quantities as were available and pressure was exerted on pig iron manufacturers to utilize them in the blast furnaces. When the accumulations had been exhausted the current scrap resulting from shell turnings was insufficient, and the assistance of the salvage department of the Ministry of Munitions was invoked to obtain the scrap material that lay waste throughout the country. The demand for scrap became so acute and prices rose so considerably that it was necessary to bring the price of scrap under control.

Blast Furnace Extensions

In July, 1916, a program of blast furnace extensions was laid down. This program arranged for repair, relining or additional plant to be undertaken at 41 furnaces then out of blast and the building of 10 new furnaces. The estimated capacity of the 51 furnaces was about 38,000 tons weekly, or rather less than 2,000,000 tons a year. This program was almost equally divided between hematite and basic pig iron. By September, 16 of these furnaces were already in blast and producing at the rate of 450,000 tons per annum, nearly all of which was hemitate, and 22 additional blast furnaces were contemplated, of which 10 were new. The 57 furnaces still to come into operation were estimated to produce about 2,250,000 tons per annum, of which 56 per cent was hematite. By March, 33 of the furnaces arranged for had come into blast and were producing at the rate of 900,000 tons per annum, three-quarters of which was hematite and the number of furnaces still to come into operation numbered 56, estimated to produce about 2,625,000 tons per annum, of which 52 per cent was hematite. Thus, up to this date, a total number of 89 furnaces had been arranged for, with an estimated capacity of about 3,500,000 tons per annum

The fact that in spite of all these efforts, the output of pig iron during the war never attained the record output which was reached in 1913 was largely due to difficulties of vessel tonnage and labor. The tonnage difficulty led to the abandonment of part of the hematite program, and necessitated concentrating on the basic side of the program, with its consequent dislocation of arrangements at many blast furnaces and steel works and its greater demand upon labor, transport, fuel, and other materials. To increase the production of basic iron it was necessary to increase the production of home phosphoric ores.

For this purpose, a Home Ore Supply Committee was set up early in March and a special section of the Ministry of Munitions formed for the purpose of (a) increasing as far as possible the production of basic pig iron to compensate for, and if possible to exceed, the extent to which the hematite production would be deficient owing to reduced imports of Spanish ore, and (b) to arrange for the conversion of sufficient acid steel furnaces to basic to utilize the basic pig iron.

On investigation 36 furnaces were found sufficiently favorably situated as regards transport, etc., to make it worth while to install the necessary plant and machinery to enable them to produce basic pig iron. These furnaces had a weekly capacity of about 18,000 tons. There were, in addition, 16 new furnaces in course of construction which had been previously sanctioned, and which were expected to reach the maximum output of 14,000 tons per week.

When the Home Ore Supply Committee was formed the weekly output of basic pig iron was slightly less than 48,000 tons. The maximum production was reached in the week ending May 5, 1918, when 65,530 tons were produced. Of the increase about 10,000 tons was due to the operation of the new blast furnaces, and the remainder to old furnaces brought into blast.

The failure to increase by as much as 32,000 tons weekly, which was the amount aimed at, was due to difficulties of obtaining sufficient labor.

The following table shows the production of British pig iron throughout the war. It shows that the production of basic pig iron increased from 2,000,000 tons in 1914 to little less than 3,000,000 tons in 1918, an increase of nearly 50 per cent, and that the proportion of basic to total pig iron produced, which had been 22 per cent in 1914, was 33 per cent in 1918. The increase in basic pig iron was wholly at the expense of forge and foundry, which dropped from 3,369,000 tons in 1914 to 2,301,000 tons in 1918. The maximum weekly output attained during the war was 191,000 tons in the week ending May 5, 1918,

Output of Pig Iron in Great Britain, 1913-1918—Gross Tons

	Hematite	Basic	Forge and Foundry	Alloys	Total
1913	3,604,823	2,529,800	3,801,547	324,145	10,260,315
Proportion %	35	25	37	3	100
1914	3,225,403	2,002,500	3,369,516	326,354	8,923,773
Proportion %	36	22	38	4	100
1915	3,564,276	2,272,684	2,701,215	255,484	8,793,659
Proportion %	40	26	31	3	100
1916	4,042,014	2,290,549	2,423,575	291,845	9,047,983
Proportion %	45	25	27	3	100
1917	3,291,927	2,722,791	2,378,870	298,190	9,321,778
Proportion %	42	29	26	3	100
1918	3,556,748	2,986,827	2,301,802	240,975	9,086,352
Proportion %	39	33	25	3	100

when, as previously stated, the basic output contributed 65,530 tons.

New Steel Capacity

Steel works extensions were also planned to raise the total increase in productive capacity by 5,000 000 tons per annum, estimated to bring the total capacity of the country up to over 12,000,000 tons. It may be recalled that the departmental committee of the Board of Trade which sat in 1916 recommended an increase in steel capacity up to 15,000,000 ingot tons. The production of basic steel as a result of the development in the ore supply was increased from 71,500 tons weekly, when the Home Ore Supply Committee was formed to a maximum of 104,800 in the week ending April 27, 1918.

The output of steel ingots and castings shows a total for 1914 of 7,835,113 tons, and for 1918 of 9,539,439 tons. Production was at its maximum in the second quarter of 1918, when it was consistently at a rate of over 10,000,000 tons per annum. The maximum attained in any one week amounted to 215,800 tons in the week ending March 9. Of the increase of 1,875,000 tons between 1913 and 1918, 1,744,000 tons was due to the increased output of basic steel. The proportions of acid and basic steel, which had been 63 per cent and 37 per cent respectively in 1913, became in 1918 51 per cent and 49 per cent respectively.

For purposes of allocation, the tonnage of finished steel products obtainable from a given output of ingots, was taken at 75 per cent. The author deals in some detail both with the methods of allocation and price control.

Pig Iron, Steel and Coke Subsidies

In the case of both pig iron and coke, after one or two increases in the maximum price, the subsidy principle was resorted to. The amount of the subsidies varied with different producers—in the case of coke for instance, the opportunity was taken to investigate the relation between costs and selling prices. In cases where it was found that the makers were earning substantial profits, the amount of the subsidy given was less than the increased cost, thus throwing upon the makers themselves such part of the increase as they could afford to meet. By adopting the subsidy method an economy was effected which would have been impossible to secure if the maximum prices had been raised, as under this method the Government contribution was restricted to the amount necessary in cases of good or average efficiency, and the higher rate which might otherwise have been necessary to keep all the works in production was given only to a few firms where, owing to special circumstances, it was impossible to make ends meet at the ordinary prices and subsidies.

The control was gradually relaxed, but the effect of this on prices was not quite what was anticipated. The difference between the control price of pig iron and the published export price was, on the average,

£2 10s. per ton, and the difference between the control price of steel and the export price, £5 per ton. These amounts, therefore, can be taken to represent approximately the average amount of the subsidies in each case, and the amount by which home prices would rise after removal of control unless costs of production were reduced. So far from costs having been reduced, however, they have continuously risen.

French Iron and Steel

As in Great Britain, so in France the year 1913 had been the year of maximum production in iron and steel. Pig iron production amounted to 5,207,000 tons and crude steel to 4,687,000 tons; pig iron having risen from 2,057,000 tons in 1892 to 4,038,000 tons in 1910, and steel from 1,600,000 tons in 1892 to 3,413,000 tons in 1910. France was thus the fourth steel producing country of the world, her production being exceeded only by the United States, Great Britain and Germany. Again, as in Great Britain, production was falling in the early part of 1914—the production of pig iron in the first half year being only 2,449,000 tons and of steel, 2,298,500 tons. Then came the general decree of August 4, calling to the colors more than 20 classes and paralyzing the industry. The works lost at one blow 67 per cent of their personnel. Directors, engineers, managers and work people left for the Army, so that the management as well as the work people was disorganized. It was necessary to reconstitute the shifts with the older work people who were not affected by the mobilization, but even in the districts farthest removed from the theater of war numerous blast furnaces, steel works, and rolling mills were stopped because of the lack of personnel and raw material. In addition to this the result of the battles in the autumn of 1914 allowed the enemy to occupy and to retain for more than four years almost the whole of the industrial area of the north and east.

Blast Furnace Increase

In July, 20 blast furnaces (a quarter of those which remained), were put in blast, and in the second half of 1915, 20 others were lit, and 10 more were ready for lighting. A similar activity marked the manufacture of steel, and in January, 1916, 97 Martin furnaces were working, 15 or 20 others were ready for working, and 35 new furnaces were in course of construction. Production was increased not only by bringing into operation blast furnaces which, for various reasons, had been idle for several years, but an impetus was given to the creation of new means of production, and the new blast furnaces which were completed during the war, or in course of construction at the cessation of hostilities, corresponded to an increased capacity of 590,000 tons.

As regards steel, the number of furnaces constructed and put into operation during the war, or in course of construction at its close, together with the percentage increase over the numbers existing in the non-invaded area, are as follows:

	Number	Increase Per Cent
Martin furnaces	109	94
Converters	56	114
Crucibles	1,280	105
Electric furnaces	18	75

Excluding those new plants destined to replace older ones, these furnaces represent a net increase in capacity of 1,760,000 tons. We have seen that the capacity left to France on the 1913 basis was 1,871,000 tons of pig iron and 1,968,000 tons of steel, and that this was augmented in the way just described; actual production, however, fell far below capacity, and even at its maximum in October, 1917, corresponded to an annual rate of only 1,813,000 tons of pig iron and 2,398,000 tons of steel.

French Steel Production

The total French production of steel from 1913 was as follows:

1913	4,686,866 tons	1916	1,951,892 tons
1914, 1st half	2,298,509 tons	1917	2,231,651 tons
1914, 2nd half	357,345 tons	1918	1,807,931 tons
1915	1,087,700 tons		

In 1914 France had 164 open-hearth furnaces, 100 converters, 24 electric furnaces and 125 crucibles. The occupation of the regions of the north and east deprived France, during the whole war, of 48 open-hearth furnaces, 53 converters, and 38 crucibles, reducing the production of crude steel, as has already been said, by 58 per cent. At the end of 1918, there were under construction in the steel works 8 converters, 41 open-hearth furnaces, 117 crucibles, and 11 electric furnaces. Adding these, France should now possess 103 converters, 225 open-hearth furnaces, 2,497 crucibles, and 42 electric furnaces.

Post-War Position

The restoration of Lorraine gives France the following capacity for production:

	Production in Millions of Tons of:				Deficiency
	Coal	Iron Ore	Pig Iron	Steel	in Coal
France, 1913	40	22	5.2	4.7	22
France and Alsace-Lorraine	44	43	9.1	7.0	30
France and Alsace-Lorraine and Saar	57	43	10.5	9.0	22

From this it will be seen that the French capacity for production has about doubled, but that the deficiency in coal remains about the same. Production has, however been severely handicapped by shortage of labor and fuel and railway congestion.

French Pig Iron and Steel in 1919

France's production of pig iron for the first half of 1919 (the latest period for which figures are available), amounted to only 1,009,000 tons, to which Alsace-Lorraine contributed 450,700 tons, or 45 per cent, and the north and east 144,000 tons, or 14 per cent—less even than the rate of production in 1918. The production of steel for the same period amounted to only 1,004,500 tons, to which Alsace-Lorraine contributed 332,000 tons, or 32 per cent, and the Center 283,000 tons, or 28 per cent.

American Competition in Exports

The author also reviewed conditions in the United States, with which readers of THE IRON AGE are already familiar.

Mr. Birkett points out that the total plant capacity for steel manufacture in the United States at the end of 1918 is put by the American Iron and Steel Institute at 54,483,000 tons. During the war, the United States built up a large export trade, both with the Allies and neutrals, and the author considers that it is therefore not to be wondered at that many view the prospects of American competition with something like alarm. With the world starving for steel in order to repair the ravages of war and in order to make up the leeway caused by the impossibility of obtaining steel for any but destructive purposes during five years, it may seem surprising that the production of iron and steel in 1919 should have been much less than in 1918. This is true, not only of Germany and France, but of the United Kingdom (where the production of pig iron was less by 1,688,000 tons than in 1918 and of steel by 1,645,000 tons), and true of the United States, where the deficiency in the make of pig iron amounted to 8,365,000 tons, and of steel to 10,500,000.

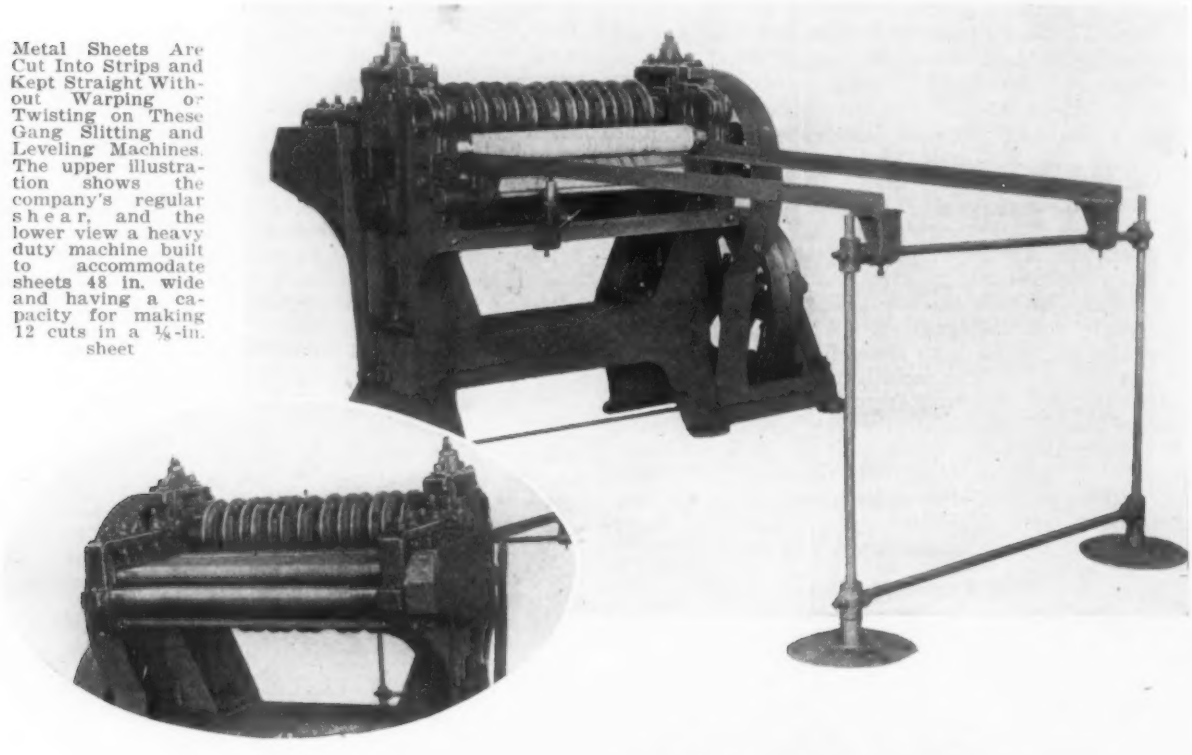
The problem for British manufacturers—leaving aside the possibility of protection, which is a political issue—is largely that of reducing costs. One of the first directions in which this may be looked for is in the economy of fuel, since the item for fuel enters so largely into the cost of steel. A natural corollary of this is the conservation of coking coal. Good coking coal is one of Britain's assets, and in view of the demand for the iron and steel industry and the requirements of France and Italy, a larger proportion of this coking coal should be reserved for metallurgical coke. Other suggestions for enabling Great Britain to meet foreign competition in the iron and steel trades were contained in the findings of the Board of Trade Committee on the iron and steel trades, which reported early in 1917.

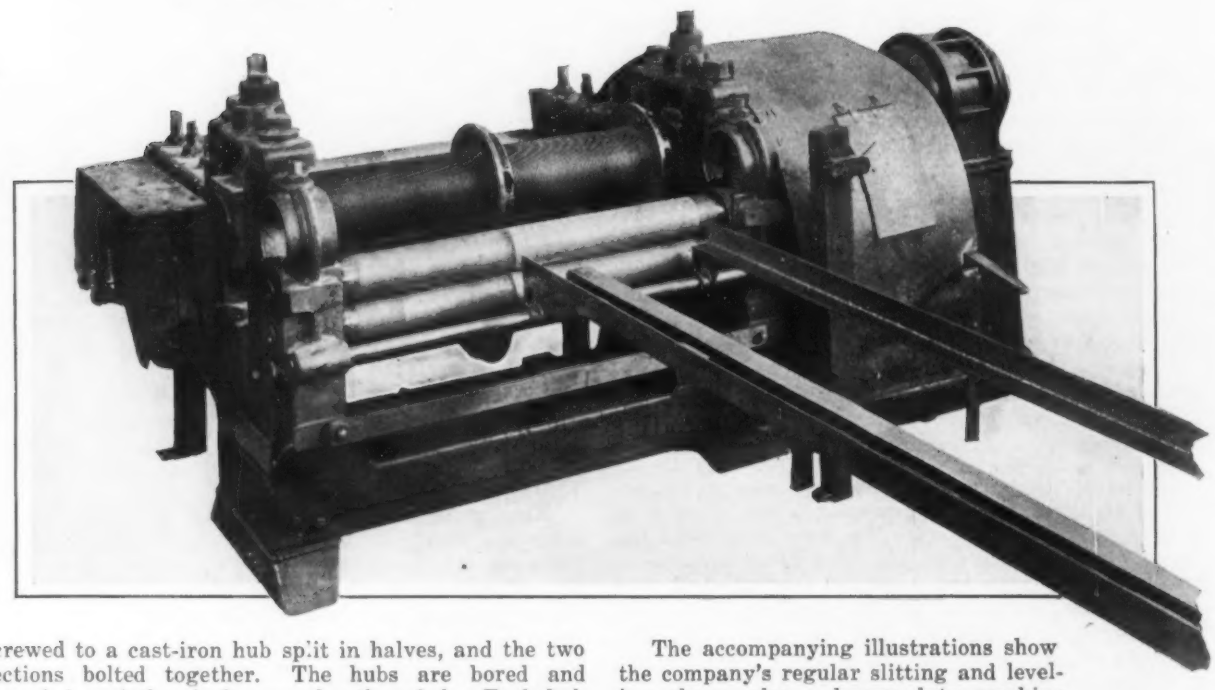
Gang Slitting and Leveling Machines

A new type of gang slitting and leveling machine has been brought out by Yoder Co., Cleveland, and will be built in various sizes to accommodate the wide range in the width and thickness of material. The machine is provided with long guides in front for the sheet metal as it is being cut into strips. A pair of rolls feeds the sheet into the cutters, and holds it in a flat horizontal position. Guides are also provided between the feed rolls and slitting cutters, the latter being so held on the shaft that stretching of the edges of the strips and winding of the strips is prevented.

The steel cutters are segment in shape and are screwed to a cast-iron hub split in halves, and the two sections bolted together. The hubs are bored and threaded, and the shafts are also threaded. Each hub is screwed to the shaft and secured by friction on the side of the thread, being drawn tight by the bolts that hold the two halves of the hub together. This arrangement gives bearing the entire circumference of the shafts, prevents wobbling of the cutters, and provides a screw adjustment for setting the cutters. It is pointed out that with this design an accurate adjustment can be made, thus to assure clean smooth cut edges.

Finger guides are at the back of the cutters and the strips pass between these guides and a pair of rolls which remove the burr, if any is left after the slitting operation. From this pair of rolls the metal passes through six straightening or leveling rolls, these making a complete seven roll leveling machine. The slitted strips produced are stated to be smooth, straight and without warping or twisting. With adjustable cutters, strips down to 2 in. in width may be cut on machines built for metal ⅛ in. in thickness and lighter gages. With metal heavier than ⅛ in. thick the minimum width of strip that can be cut with adjustable cutters is 3 in. When narrower strips are required solid cutters and spreaders are used.





Metal Sheets Are Cut Into Strips and Kept Straight Without Warping or Twisting on These Gang Slitting and Leveling Machines. The upper illustration shows the company's regular shear, and the lower view a heavy duty machine built to accommodate sheets 48 in. wide and having a capacity for making 12 cuts in a ¼-in. sheet

The accompanying illustrations show the company's regular slitting and leveling shear, also a heavy duty machine built to accommodate sheets 48 in. wide and having a capacity for making 12 cuts in a ¼-in. sheet.

The Boston Chapter, American Steel Treaters' Society, at its meeting, April 13, held at the Engineers' Club, had G. E. Mansfield, Wheelock Lovejoy Co., Boston, as the chief speaker, his topic being "Surface Carburizing."

Profitable Uses for Foreign Money

How American Manufacturers Can Utilize Funds Now Idling Abroad—Suggested Purchase of European Shops

BY STERLING H. BUNNELL*.

EVERY American citizen is directly interested in the recent proposals that the United States should make further huge loans to Europe to re-establish European credit and rescue our previous loans from possible total loss. Europe as yet has paid no interest on the vast credits advanced by the United States. Unless Europe pays the interest on the money we authorized our Treasury to loan abroad we, the citizens of the United States, must pay it ourselves by taxes. However, European industries are so crippled by lack of raw materials and coal, war deterioration and shortage of food for the workers, that further large credits are needed to supply the necessaries for industry. And while bankers and business men were considering the difficulties of raising further funds to loan abroad, our industries have proceeded to export goods of all sorts on various terms of payment, until now the ports of Europe and, in fact, every warehouse and storage place even to farmers' barns along the railroads for 50 miles inland into Europe, are stuffed with American goods, most of which have not been paid for.

The prices of these goods to the Frenchman are three times what used to be the fair equivalent of their values in dollars. The Italian must pay even more, and the German must raise about 15 times the normal equivalent of the dollar in marks. The new countries are perhaps in greater difficulties, for their unknown currencies have even more unstable values than the older moneys. Therefore, most of the American goods now stored in Europe are practically unmarketable. A portion has been sold, or is being sold, for foreign moneys, with the intention of keeping the funds on deposit in Europe until exchange improves. The vast majority of the unsold goods are carried on money borrowed from American or European banks, and are costing their American owners interest, storage, insurance and depreciation daily. The amount of American money loaned on goods lying in storage for export trade here and abroad cannot be definitely determined, but it must be considerably more than a billion dollars. The tying up of this vast amount of what should be working capital for American industries is undoubtedly a principal cause of the lack of time money here to-day. The manufacturer finds it almost impossible to persuade the banker to provide him with working funds, because so much of our loanable funds is represented by stored goods in export trade.

Individual Initiative Needed

With billions tied up in this way, and further billions demanded for direct loans to governments, it is time for every manufacturer and merchant to look out for his own interests and find for himself ways and means for putting the idle European funds at work earning a profit, and for furnishing to Europe such necessary articles as he can, under terms that will not tie up further credit, but will help Europe to pay its interest on the funds already loaned. The debts must finally be paid to us in goods made in Europe, or bought elsewhere (as in Siberia or China) with European funds. But we do not want and cannot use fifteen or twenty billions of dollars worth of foreign goods all at once (even if Europe could supply them), any more than John D. Rockefeller could want or use the enormous number of barrels of flour and sugar and other commodities his great wealth could buy. The money loaned must necessarily stay in Europe for the present, and should work for us there. This admission makes the difficulties much less, because we now only need to find ways of raising a billion or so of dollars per year in goods or service usable by Americans. To put it another way, the idle funds must be invested in European industries, and the profits only brought home to America, or spent by Americans in Europe.

The thing can be done in many ways—fortunately enough, since the amounts involved are so large and the territory covers a whole continent. To illustrate one method: The owner of a shipment of shoes held in storage in Europe under constantly accumulating cost of interest, storage and insurance, can sell the goods for much more than the normal equivalent of their dollar value and invest the proceeds in securities of the foreign country, earning an income greater than the interest on the loan. It is, undoubtedly, perfectly easy to buy a principal interest in a factory or public service corporation with the proceeds from the sale of American goods in the same country, and to make a profit on the purchase and a further profit by shipping the income home in the form of salable goods. The result in every case is that the American goods are put to use, the idle funds are put to work, and the foreign purchasers of the goods are put in better condition to pay the interest on their debts.

How to Help on European Debtors' Problem

There is no difference in principle between an individual debtor and a debtor nation. In the case of either the creditor can recover the amount lost by permitting or assisting the debtor to correct past bad business methods, to feel confidence in future improvement and success, and to purchase the necessary minimum of goods to carry on his business. A few thousand American creditors, each working on the little affairs of his own particular foreign debtors, can put international business in order while the international leading lights continue to stand aghast at the size of the sum total of international debts. Our European debtors need food, clothing, agricultural implements, building equipment and some materials, devices to save heavy labor, tools and machinery for developing national wealth like mines and oil wells, and rapid production factory equipment for turning out the simpler and cheaper tools that go into the hands of the enormous peasant population. All these are elemental necessities. Luxuries should not be supplied at all to Europe at present, yet in our unwisdom we have been helping our European debtors to squander enormous sums in buying our motor cars,

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automatic music and other goods of more or less non-essential character, and in so doing to smash exchange so that the European poor man cannot buy the American flour necessary to make up the deficiency in European crops.

Every manufacturer in the United States who maintains an export department knows that to-day there is plenty of demand from Europe, but no actual business. The foreign agent or correspondent offers to pay at some rate of exchange well below the current figure, or asks a very long credit in the hope that exchange may improve, or says frankly that he has no hope of purchasing anything from America at present. Many American concerns have granted the credits or accepted payment in foreign currency which is on deposit abroad, so that they have now gone to the limit of their ability to finance. Now comes a large inquiry from the Russian co-operative group, or a reliable house in Poland or Czechoslovakia, with payment offered in sterling or other European currency, and the manufacturer feels forced to turn it down, while German, Italian and Austrian concerns can quote far below the American because of their depreciated currencies, yet cannot deliver the quantities because of their lack of materials.

Buying Foreign Factories

The only possible way for the American to stay in the market is by making use of available foreign funds to buy a foreign factory at a good shipping point, and make the goods abroad by the use of foreign funds. The work can be started with raw materials of component parts from the American shop. There will be a large saving in freight and insurance, much of the value of the finished product will be the result of foreign labor and overhead, and the profit can be put back into the factory until exchange improves, or used to buy foreign goods to be sold in America for dollars.

There is nothing impossible or even difficult in operating a factory abroad. True, Americans do not generally learn foreign languages, but what nation has as many citizens to whom another language than English is native? There is not a language spoken in Europe for which many capable business men, technicians and mechanics cannot be found among American citizens. As for the difficulty in building and equipping new factories, all western Europe was over-industrialized before the war and more so during the long conflict. Excellent factories over there are now idle or nearly so. Under American ownership and superintendence, one of these factories could be quickly brought to superiority over those using old methods, with advantage to the country in reduced cost and increased quantity of product.

Starting in Foreign Manufacture

The small amount of exported material needed to start an American-managed factory abroad is limited to special component parts more easily made here even at greater cost perhaps, some raw materials and special tools, and a few men as superintendents, foremen and leading hands. The bulk of the raw material could undoubtedly be obtained from countries where exchange rates are favorable —if not now, then soon, as production becomes more nearly normal. The whole foreign property could be paid for in American made goods from the parent concern in America. For instance, a hundred tractors at $2000 each, sold at two-thirds of the present exchange rate, or say ten francs to the dollar, would provide a fund of two million francs, which would undoubtedly purchase a controlling interest in a well-situated machine works in France and provide some working capital besides. If the turnover from the first year's operation should be twice the capital investment, and the profit 10 per cent on the turnover, the American interests would have 400,000 francs to use in France or send home, which would not be difficult to turn into dollars by the purchase and resale of silk or "Paris goods." Probably, however, the funds realized by profits would be left to work in France for two or three years longer, increasing constantly in their dollar value as exchange slowly returns to normal.

Application to Machinery Trade

This method of realizing a profit from idle foreign funds is well adapted to the use of manufacturers of many kinds of machinery badly needed in Europe. Among such lines are agricultural machinery for tillage, cultivating and harvesting; implements and tools; building construction equipment like concrete mixers, block machines, brick and tile machines, concrete handling devices, wood-working machinery, roofing paper manufacturing plants, etc. Automotive machinery of the cheaper quantity-production types in which America excels (first, assembling shops using American components, and, later, component-manufacturing shops) could be operated at a profit in every European country. Package-freight conveyors as well as car loaders and unloaders would be of wide application in the coming few years when such an enormous quantity of packages of foodstuffs, clothing, boots and other articles to replenish European stocks must be handled between boats, railroads and warehouses in all countries. Road machines, scrapers, drags and pavers will be wanted all over central and eastern Europe and in the Near East. In Russia and China there will be required mining machinery, prospecting and oil-well equipment, engines and motors.

American Rolling Stock in Belgium

Locomotives and railroad cars are wanted in every country as well as in our own, and already Belgium is reported as having closed a contract with American builders of rolling stock to furnish not only such equipment but the shop and machinery with which to build it in Belgium. Manufacturers should note that the builders of these engines and cars need furnish nothing but brains and skill, and will take out of Belgium only the reward of their intelligence—the profit. It would add a huge sum to Belgium's debt to America if the whole bill for rolling stock were to be paid in dollars at three times the par value; but 10 or even 20 per cent of the amount, payment deferred and spread over several months or years, will not be noticeable in its effect on the exchange market, while the use of the engines and cars will bring Belgian industry back to normal and help to restore exchange.

The writer would be glad to correspond with any manufacturer who would like to consider ways and means of developing a manufacturing connection in Europe. When our own period of readjustment comes, and profits here cease for a time, Europe will have passed through the worst of her reconstruction and be returning to financial strength. In that time, the manufacturer who has a branch factory in some European port and can manufacture at low prices and ship by quick and convenient routes into the most active centers of European industry will find himself in an extremely comfortable position.

The S. Obermayer Foundry Supplies Co., 2563 West Eighteenth Street, Chicago, will construct a two-story brick office building, to cost $10,000.

FUEL OIL PRICES

Advance Expected, as Available Supply Is Less Than the Demand

CHICAGO, April 10.—As the result of the coal strike in December and uncertain production since that time, the consumption of fuel oil by industrial plants has materially increased. It is estimated that three of the leading steel plants in this district are now using 33 1/3 per cent more oil than they did formerly. The outlook in the oil market is, therefore, a matter of considerable interest at the present time.

Formerly fuel oil declined in the summer months and undoubtedly the expectation of a repetition of the performance of past years accounts for the extreme caution now shown by large buyers. According to prominent sellers, however, past experience is no criterion of what will happen this year. John M. Carson, general sales manager, the Western Petroleum Co., Chicago, states that the available supply of fuel oil is 40 per cent less than the demand. The bulk of the fuel oil from the Mid-Continent field comes from the smaller refineries, known as "skimmers," which confine their output to gasoline and fuel oil. In December, 1919, when the wholesale price of gasoline fell to 14½c. a gal. because of the large surplus of that product, and crude oil rose to $3.50 per bbl., 72 skimmers were forced to shut down. According to Government reports, available stocks of gasoline on Jan. 1, 1920, were 149,466,000 gal. in excess of existing supplies on Jan. 1, 1919.

As the situation in gasoline and crude oil has not materially changed since the first of the year, these skimmers have been unable to resume operation. The larger refineries, on the other hand, are rapidly introducing cracking processes, thereby reducing their output of fuel oil about 50 per cent. This development is accounted for by the increasing demand for by-products, such as lubricants, wax, asphalts, etc. By way of example, Mr. Carson cited a certain lubricating oil which, when it was first made by a certain refinery last year, sold at 10c. a gal., whereas it now brings 52c. a gal. wholesale.

Pale oil, a motor lubricant, which sold last year at 14½ to 15c., f.o.b. refinery, is now commanding 26½c. For these reasons it is probable that the output of fuel oil in the Mid-Continent field is hardly 25 per cent of what it was a year ago.

No relief can be expected from Mexico, Mr. Carson said, because of the high prices offered by other countries and the increased use of fuel oil by sea-going vessels. Practically all ocean ships now being constructed are being equipped for oil, and many vessels which have not heretofore used oil are being converted to oil burners.

Because of the shortage of crude oil, few refineries are able to operate at capacity, says W. K. Evans, Chicago sales manager, Roxanna Petroleum Corporation. One important plant, he stated, is producing at the rate of 13,000 bbl. a day as against a capacity of 30,000 bbl., while another typical refinery is making but 15,000 bbl. daily, compared with a maximum output of 30,000 bbl. According to a recent report of the United States Bureau of Mines, the supplies of crude oil above ground on Feb. 1, 1920, aggregated more than a million and a half barrels less than the available stocks on the same day a year ago. In past years about 45 per cent of the crude petroleum produced in the United States went into fuel oil. For the reasons mentioned, this percentage will probably be materially reduced in the current year.

Steel Treaters' Annual Convention and Exhibition to Be Held in Philadelphia

The second annual convention and exhibit of the American Steel Treaters' Society, Chicago, combined with the convention of the Steel Treating Research Society, Detroit, Mich., are to be held in the Commercial Museum, Philadelphia, Sept. 14 to 18, 1920. This convention will be attended by specialists on steel treating, and also by most of the manufacturers and agencies of products and materials pertaining thereto. The membership includes those interested in the art and science of the heat treatment of steel and consists of metallurgists, chemists, metallurgical and chemical engineers, foremen of heat treating departments, superintendents, works managers, purchasing agents, furnace and general sales representatives. Applications for space at the exhibition should be addressed to Department of Exhibits, American Steel Treaters' Society, 208 North Wabash Avenue, Chicago.

Non-Ferrous Casting Section of American Foundrymen's Association

At the annual meeting of the American Foundrymen's Association to be held in Columbus, Ohio, Oct. 4 to 8, a new department will be added to the program to be known as the non-ferrous casting section. Here the papers and discussions will be of interest to the practical brass and aluminum foundryman. It is understood that the Institute of Metals division of the American Institute of Mining and Metallurgical Engineers will hold a meeting in Columbus during the same week, and it is proposed to have a joint session with the non-ferrous section of the American Foundrymen's Association. This announcement will be of interest to the more than 2000 manufacturers of non-ferrous castings in the United States and Canada.

C. S. Koch, president American Foundrymen's Association, has appointed L. W. Mueller, H. Mueller Mfg. Co., Decatur, Ill., and Robert S. Archer, Aluminum Manufactures, Inc., Cleveland, as members of the committee on papers to represent this new section.

The other sections that will be represented on the program of the American Foundrymen's Association are the gray iron section, the steel foundry section, the malleable iron section, and the industrial relations section. In conjunction with these meetings will be held as usual the exhibit of foundry and machine shop tools, equipment and supplies.

Pittsburgh Traffic Club Dinner

The 18th annual dinner of the Traffic Club of Pittsburgh was held in the William Penn Hotel on Thursday, April 8, and many men notable in railroad, business and financial circles were present. The chief speaker was Rev. Dr. Charles A. Eaton, formerly pastor of the Madison Avenue Baptist Church, New York, and for the past two years engaged in industrial betterment activities.

J. F. Townsend, traffic manager of the National Tube Co., Pittsburgh, acted as toastmaster, and in a brief address reviewed the conditions existing in traffic circles in the Pittsburgh district. He referred to the shortage of cars and the slow movement of traffic, but predicted that with the return of the railroads to private ownership, and the addition of more motive power and cars, traffic conditions, not only in the Pittsburgh district but at all other points, would soon see improvement. The dinner was the most successful ever given by this organization, and over 800 persons were present.

Will Inspect Trumbull Steel Co.

On May 22, the Pittsburgh Association of Iron and Steel Electrical Engineers will make an inspection trip to the plant of the Trumbull Steel Co., Warren, Ohio. This plant embraces an open-hearth steel works, hot and cold-rolled strip mills, sheet and tin plate mills. In the evening, a paper will be read by William F. Rese, electrical engineer, describing the electrical installation in the plant of the Trumbull Steel Co. On June 12, the Pittsburgh association will meet in that city, and a paper entitled "Current Limit Reactants" will be read by R. H. Keil, power engineer of the Jones & Laughlin Steel Co., Pittsburgh.

Manufacture of Electric Ferroalloys*

Factors Affecting Success—Design of Furnace for Various Alloys—Power Consumption—Recent Improved Devices

BY C. B. GIBSON

THE success of any ferroalloy plant is dependent on several factors: The proper design of furnace, accessories, and electrical equipment; a thorough knowledge of the metallurgical problems; low power rates, and advantageous location of plant with respect to labor, raw materials, freight facilities and market.

The general design of electric furnaces for producing alloys is much the same, but differ in the electrical connections, the number and arrangement of electrodes, and the shape and size of the hearth. Furnaces are either single, two, or three phase.

The single-phase furnace is arranged for either one or two electrodes. The Siemens is an example of the former type. Here the current enters one vertical electrode which is suspended in the furnace directly above the hearth. The furnace is lined with a refractory material and carbon, which is connected to the returning conductor of the circuit. The furnace shell is usually round. A tap hole is provided at the lower side. The electrode is raised or lowered by hand or a motor-operated winch connected to the electrode by a cable. This type is sometimes referred to as a pot furnace, and is employed in the production of ferrotungsten and molybdenum. If the alloys cannot be tapped the furnace can be knocked down and the alloy button removed.

The single-phase furnace is also built using two electrodes, and the current which enters one electrode passes through the charge and out the other electrode. The shell is similar to the Siemens furnace, although it is usually rectangular. It is built with open or closed top. The latter is used with metals of high-melting point in order to conserve the heat.

The three-phase furnace is used almost entirely for producing ferromanganese, forrosilicon, and ferrochromium. The shell is either rectangular or oval, lined with a refractory material and the bottom with carbon. The bottom shell is either air or water cooled and the top hole is provided at the lower side. The open top permits continuous charging of the furnace and while the volatilization losses are greater, this loss is compensated for by the greater ease of operation and handling of the furnace.

As to the most suitable size of furnace, this is dependent on the kind and character of alloy produced. Small single-phase furnaces lend themselves most suitably for such alloys as cannot be tapped and require taking the furnace apart in order to remove the alloy. For alloys which can be tapped and for which there is a larger tonnage demand, these are made in the large open top furnaces, as this type is more efficient. Also, the operating costs in labor and attendance are less.

Proper Design of Furnaces

The proper design of a furnace is dependent on several factors: There must be a proper relation of the essential parts of the furnace; the character of the charge and the magnitude of the electrical parts, which are factors in producing heat and causing the chemical reactions and smelting of the materials, must be carefully considered; the size and shape of shell, size and relative location of electrode, and amount of power output, all influence to a greater or lesser degree the results obtainable.

The question of single versus three-phase furnaces is influenced by the power requirements. A single-phase load often causes considerable unbalancing to a three-phase line, which is usually objectionable to the central station company. This oojection is often overcome by connecting a number of single-phase furnaces to the three phases and distributing the load as evenly as possible. With such an arrangement, it is the aim to have several furnaces operating so as to give more nearly balanced conditions. The three-phase furnace is the most desirable from the standpoint of balanced load.

Power Consumption

The power consumption of a furnace for different alloys is dependent on the size of the furnace, the proper handling of the charge and operations, and on the percentage of alloy being produced. Tables Nos. 1 and 2 give the approximate kw. days per ton of alloy produced.

These values give a fairly close check on the power requirements, materials charged and tonnage output for the more common ferroalloys. The amount of electrical energy required per ton of output may be calculated theoretically. It is first necessary to determine the heat necessary to bring the charge to the temperature at which the reaction takes place and the energy absorbed by such reactions, and add to this the losses in radiation, conduction, and in the gases given off, also the electrical losses in electrodes, and circuit and deduct from this the heat developed in the furnace by the chemical reactions. Knowing the amount of the charge, the specific heats, the latent heats, and the physical characteristics of the furnace, these calculations can be made.

Table 1.—Power Consumption and Raw Materials for Some Ferroalloys
(E. F. Cote.)

	Per Ton of Manufactured Product		
Product	Kw.-Day (24 hr.)	Raw Material Handled, Tons	Tons Raw Material Handled, Per kw. yr.
Ferrosilicon, 50 per cent.....	300	3.0	3.3
Ferrosilicon, 80 per cent.....	650	4.0	2.0
Ferrochromium, 8 per cent..	360	4.0	3.7
Ferromolybdenum	360	3.5	3.2
Ferrotungsten	325	3.0	3.0

In addition to a properly designed furnace, there are several other equally important considerations, such as furnace voltage, type of electrode holder and method of cooling, facilities for charging and tapping, suitable refractories, arrangement of winch mechanism, etc.

The Electrical Equipment

Equally important as the furnace is the proper selection and design of the electrical equipment. The electrical equipment for a ferroalloy furnace comprises: Incoming line protective equipment; furnace transformers; motors for operating the winches for raising and lowering the furnace electrodes; automatic regulators for maintaining constant current at the furnace, and switchboard panel, including instruments, circuit breakers, relays, etc.

The protective equipment, such as lightning arresters, choke coils, and disconnecting switches, also the switchboard panels are usually of standard construction, and it is only necessary to make the proper selection of apparatus to meet the existing conditions. One of the most important points is to make sure that the main circuit-breaker is of sufficient size and rupturing capacity to open the furnace circuit with the power concentrated behind it. In a large number of installations, especially those using hydroelectric

*From a paper presented at the Thirty-seventh general meeting of the American Electrochemical Society at Boston, April 9, 1920. The author is with the Westinghouse Electric & Mfg. Co., Pittsburgh.

power, there are many thousands of horsepower feeding directly into the line.

Direct-current winch motors for driving the winches are generally used, although alternating current is used in a few cases. The motors if installed in the furnace room are totally inclosed to protect them from the dust and dirt usually present. In the more recent installations, the winch and motor are located in the transformer room and connected with the electrode by means of a cable supported on pulleys.

In selecting a winch it is necessary to know the weight to be lifted and the speed of the electrode travel, and the manner of fastening the cable.

Table 2.—Data of Prof. Georges Flussin

Produce	Per Ton Manufactured Product: Kw.-Day (24 hr.)	Tons Raw Material Handled, Per Ton	Tons Raw Material Handled, Per kw. yr.
Ferrosilicon, 10 to 12 per cent.	109	1.55	4.7
Ferrosilicon, 25 to 30 per cent.	172	1.90	3.65
Ferrosilicon, 45 to 50 per cent.	333	2.90	2.87
Ferrosilicon, 70 to 80 per cent.	714	4.30	1.99
Ferrosilicon, 90 to 95 per cent.	1,000	6.40	2.11
Ferromanganese, 18-20 per cent.	67	1.80	8.85
Ferromanganese, 70-75 per cent.	167	3.15	6.23
Ferrochromium, 10 per cent C.	286	2.97	3.34
Ferrochromium, 1 per cent C.	555	4.05	2.41
Ferrotungsten	286 to 400	2.70	3.11 to 2.23
Silicomanganese, 10 per cent Si-20 per cent Mn	133	2.20	5.46
Silicomanganese, 10 per cent Si-70 per cent Mn	217	2.50	3.80
Silicomanganese, 25 per cent Si-50 per cent Mn	333	2.70	2.69

The proper selection of furnace transformers is one of the most important considerations on account of the unusually severe operating conditions of a furnace load. The transformer should be designed to withstand properly and effectively the stresses which are set up within it due to surges and short circuits caused by the electrodes coming in contact with the charge. In the smaller sizes the bracing problem is not as important, but for transformers feeding furnaces of 5000 to 20,000 hp. and with large energy capacity behind the line this is a more difficult problem. Fortunately, transformers are and can be designed and built to meet fully these conditions.

Since the average furnace voltage is comparatively low for the transformer capacity, the low-tension winding is of few turns of large cross section and the leads are of still larger section. The coils and leads must be so arranged, spaced and interlaced as to give a balanced design.[1] Since transformers can be designed to withstand effectively and satisfactorily momentary short circuits, from this standpoint it is unnecessary to provide high internal reactance in the transformer. The low-voltage leads of small transformers usually consist of flat copper bus, drilled and spaced to facilitate connecting to the bus bars running to the furnace.

Another important consideration is the question of ventilation of the furnace transformer. Due to the heavy secondary current and rather severe overloads occurring, the copper coils and iron core must be properly ventilated in order to give uniform heating with absence from hot spots in the transformer.

The furnace voltage required for smelting ferroalloys usually ranges between 50 and 100 volts. The most suitable voltage depends on the general furnace layout. Provision is often made in the transformer for several different low voltages, which is an advantage where different alloys are made in the same furnace at different times.

Tendency in Current Consumption

The general tendency is to work a furnace just as hard as possible, as regards the k.v.a. input, with the view of increasing the tonnage output and of decreasing the smelting period, thereby effecting certain economies in operation. There are, however, conditions which limit the amount of power which can be fed into a furnace. Among these is the voltage of the service and the currents involved, the inductance of the circuit, as determined by the form and dimensions of the circuit and frequency, skin effect as determined by the shape and size of conductor section. The reduction of self-induction and skin effect are two of the most important considerations. They are reduced by laminating the individual conductors of the proper size and shape and by interlacing the conductors.

In laying out new furnace installations, or in planning to improve the operating conditions of existing ones, a careful study is essential of the problems relating to the bus and cable layout. Relatively the problems involved in 25-cycle installations, for the same size furnace, are not as serious as for 60-cycle, for the reason that maximum energy that can be fed into a constant voltage circuit at different frequencies is inversely proportional to the frequency. In other words, where a 10,000-hp. 60-cycle furnace is about the limiting size for a well-designed furnace and bus layout, 22,000 hp. is the corresponding size for a 25-cycle furnace.

It is sometimes advantageous to feed more power into a furnace during certain periods. This is possible by using a higher impressed voltage, since the power input to a circuit of given frequency is proportional to the square of the impressed voltage.

Of the more recent developments in electric furnace equipment, undoubtedly the greatest improvements have been in those devices for automatically controlling the current input to furnaces by a movement of the electrodes. While it has been generally recognized, in the past, that automatic regulation, as compared with manual operation, effects a large saving in labor charges, more efficiently utilizes the electrical power and reduces materially the time required for a charge, these new devices embody many improved features of interest to the furnace operator. These features permit of much higher speeds of electrode travel, eliminate all over-travel or pumping of the furnace electrodes on melting and of arcing at regulator contacts, also prevent any electrode feeding down into the molten bath.

Table 3.—Figures of R. H. Kuney on the Kw. Hours Per Pound for Certain Ferroalloys.

Product	Size Furnace: Tons Charged	Kilowatts	Type	Per Cent Recovery	Kw. Hr. Per Lb. Alloy Tapped
Ferrosilicon, 50-70 per cent	3–4	1,000	1-Ph.	....	2.5-3
Ferromanganese, 75-80 per cent Mn	15	1,200	3-Ph.	70-85	2.2-3.3
Ferrochromium, 60-65 per cent Cr, 4-6 per cent C	13–15	750	3-Ph.	70-80	3-4.5
Ferrotungsten, 70-75 per cent W	0.75	150	1-Ph.	80-90	2.1 Sm't. 1.7 Ref.
Ferromolybdenum, 60-65 per cent Mn., 15-20 per cent C	....	150	1-Ph.	78-80	7-7.5*
Ferrovanadium, 30-35 per cent V, 3-4 per cent Si	1	150	3-Ph.	75 Av.	3.4
Ferrouranium, 35-50 per cent U., 3-4 per cent C	800 lb.	75	1-Ph.	75	3.5

*Per lb. of Mo in alloy.

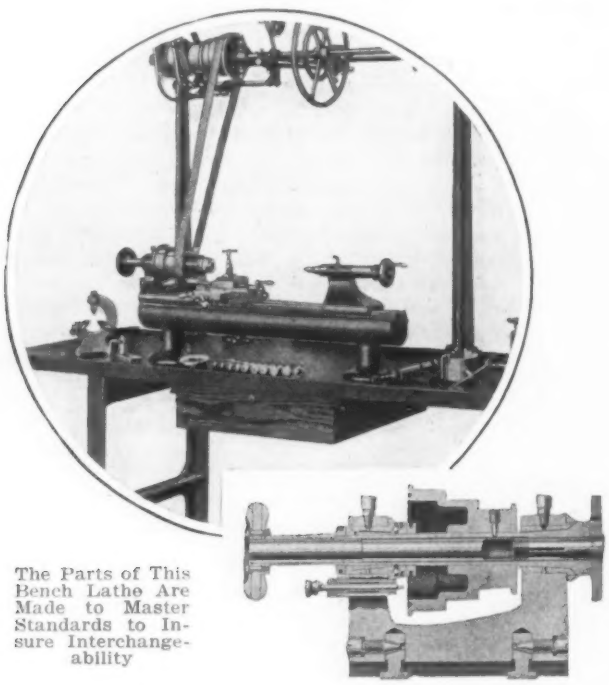
The entire ferroalloy field is one of absorbing interest. The possession of large supplies of alloys was one of the important features in winning the war, as alloys were indispensable to the steel industry. New alloys and new uses for those now available, or combination of alloys, will be found, and we can confidently expect this industry to keep pace with the steel industry in meeting the present and future demands.

A new device which is a combination of electric contact and supporting mechanism for electric light fittings has been invented by E. Cantelo White, manager general lighting department, Western Electric Co., New York. The ordinary wall or ceiling outlet is replaced by a supporting receptacle which is flush with the wall surface. The fixture body plate has curved prongs which are readily inserted into the receptacle, make electric contact and support the fixture. The outlets being flush, are inconspicuous and thus a number can be installed to provide for moving the fixture from one location to another when required.

At the monthly meeting of the Engineers' Society of Western Pennsylvania in the Union Arcade, Pittsburgh, Tuesday evening, April 6, E. G. Bailey, president of the Bailey Meter Co., Cleveland, made an address on "Power Plant Instruments and Meters."

Precision Bench Lathe

The bench lathe shown in the accompanying illustration is a recent product of the Package Machinery Co., Springfield, Mass. It will be known in the market as the P.M.C. precision bench lathe. All of its parts are made to master standards thereby to insure their interchangeability. The length of the bed is 36 in.; the center distance, 16 in.; the swing over the bed, 8½ in.; the tool post takes a $\frac{7}{16}$-in. to $\frac{9}{16}$-in. tool, and the collet capacity is ⅝ in. The head-stock spindle has a 0.825-in. hole through the chuck seat, the diameter of its spindle nose is 1⅝ in., and there are 12 threads per inch on the spindle nose. The spindle bearings have a double taper and are adjustable for wear. There



The Parts of This Bench Lathe Are Made to Master Standards to Insure Interchangeability

is a ball thrust bearing in front of the rear bearing to take the end thrust, a feature designed to eliminate the seizing of the front bearing. This thrust bearing is adjustable. Dust rings are provided on all bearings. The head-stock can be moved along the bed by releasing two taper screws, bolts going through the bed being unnecessary in this case. The drawing-in spindle hand wheel is made of three-ply wood and is 4 in. in diameter.

The diameter of the tail-stock spindle is 1 in. and it has a No. 5 B. & S. taper for center. The spindle has a travel of 4½ in. and is locked by a split nut inside the barrel, thus to avoid slitting the barrel and to keep it in alignment. It is moved by a hand wheel instead of by crank so as to give a more steady feel when drilling.

The key holding the tail-stock spindle from turning is L shaped instead of T, the common practice. When inserting the spindle, the key automatically is lined up with the key-way, thus to eliminate becoming jammed crosswise. It is clamped to the bed by an eccentric clamping bolt.

The compound slide rest has large bearing surfaces, and the slides are adjustable for wear. The wear in the feed screw threads can be taken up by split nuts, which are renewable when worn beyond adjustments. The feed screws are graduated for 0.001 in., and the compound rest is graduated in degrees. The upper slide can be swung completely around without interference, making possible its use as a ball rest. The shoe is fitted to and held to the bed by a spring, explained as making it act as a wiper instead of a collector of chips.

The rest clamp is separate from the rest sleeve, thereby allowing the handle to be swung into convenient position before clamping. The bench occupies a space of 6 in. x 39 in., and the weight of the lathe is stated to be sufficient to prevent shifting of position.

Engineers to Discuss Safety

The first spring meeting of the Engineering Section of the National Safety Council will be held in the Engineering Societies Building, New York, April 27. The relation between safety and engineering, and the engineer's place in the modern industrial world will constitute the motif of the entire program. C. P. Tolman, chairman, manufacturing committee, National Lead Co., and chairman of the engineering section, will preside. The program is as follows:

The Relation of Safety to Engineering Efficiency, by L. A. DeBlois, manager safety section, E. I. du Pont de Nemours & Co., Wilmington, Del. Discussion opened by F. P. Sinn, assistant to the vice-president, New Jersey Zinc Co., New York.

Safety Instruction in Engineering Colleges, "The University of Illinois Plan," by Bruce W. Benedict, manager of shop laboratories, University of Illinois.

How to Interest Student Engineers in Safety, by Prof. G. S. Blessing, department of engineering, Swarthmore College, Swarthmore, Pa.

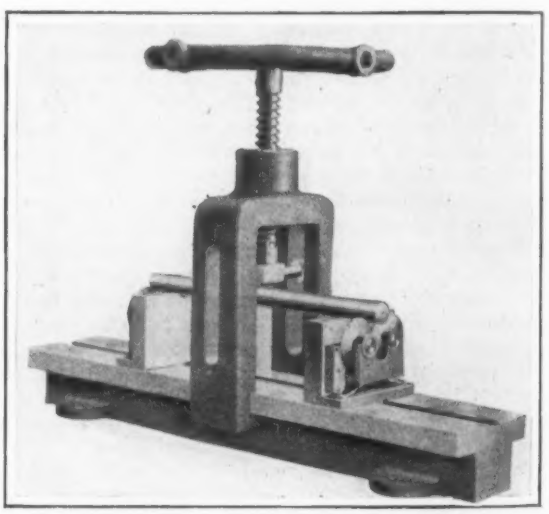
The Movement for Uniform Safety Standards and the Engineering Section's Part, by David S. Beyer, vice-president and chief engineer, Liberty Mutual Insurance Co., Boston.

There will be a round-table discussion on proposed standards for guarding of belts, gears and other power transmission. Discussion will be opened by Thomas Stanion, manager safety and sanitation department, Aluminum Manufacturers, Inc., Cleveland.

Ball Bearing Trueing Machine

The bar straightening machine shown in the accompanying illustration was recently designed by its manufacturer, the Whitney Metal Tool Co., 109 Forbes Street, Rockford, Ill. The machine embodies the company's patented ball-bearing spindle, which is rated to give over 40,000 lb. per sq. in. pressure. Quick straightening can be accomplished, it is explained, as it is not necessary to take the bar to be straightened out of the block and place it between a pair of centers.

The small rollers on the outside of the V block are equipped with ball bearings. After releasing the screw,



Quick Straightening Is a Feature of This Ball Bearing Trueing Machine

the bar to be straightened is given a whirl with the hand and the high spot located. The pressure is then applied with the ball bearing screw, the rollers descend and allow the work to come in contact with V blocks, after which increased pressure on the screw acts to straighten the shaft. When the pressure is released flat springs operate to raise the rollers high enough so that the work will clear the V block.

The hand wheel is provided with a socket so that a bar can be inserted and used as a lever should it be necessary. The machine has a capacity for bars 2 in. in diameter. The diameter of the screw is 1½ in., diameter hand wheel 15 in., length of bed 36 in. and weight complete 264 lbs.

American Electrochemical Society

Electrically Produced Alloys and the Power Problem Discussed at General Spring Meeting — Self-Baking Electrodes — Electric Brass Melting

THE rapid advances made in very recent years in electrochemistry, particularly as regards alloys, metals and steel, were concretely emphasized by the markedly successful sessions in Boston last week at the Copley-Plaza Hotel, April 8, 9 and 10, of the 37th general meeting of the American Electrochemical Society. Symposiums on electrically produced alloys, on power for electrochemical purposes, were the features, these sessions being held jointly with the American Institute of Electrical Engineers. Other general meetings devoted to miscellaneous topics were featured by papers and discussions on carbon electrodes, electric melting of brass, electric steel and pig iron, corrosion of iron and steel and other topics. Unusually well attended sessions, punctuated frequently by live discussions, characterized most of the meetings.

Production of Alloys in Electric Furnaces

THE feature of the convention was the session on Friday morning, April 9, in the Swiss room of the Copley-Plaza Hotel, devoted to symposium on "Electrically Produced Alloys." The electrochemists were joined by the American Institute of Electrical Engineers, which was holding a convention at the same place, so that the attendance at this particular joint meeting was nearly 400. It was a striking testimony to the place which ferroalloys have assumed in the steel and metal industry. The program was an elaborate one with 10 papers devoted to ferro- and other alloys, and three to other electrical subjects.

The Vanadium Situation

Ferrovanadium was the alloy which drew the most fire. This was brought out by a paper "Ferrovanadium," by B. D. Saklatwalla, of the Vanadian Corporation of America, Pittsburgh, presented in abstract by the author. It dealt with the raw material, the difficulties in securing the ore, the treatment this must undergo, and the methods used to reduce the ore to the ferroalloy. This will be abstracted in a later issue of THE IRON AGE.

The discussion was opened by G. M. Berry, chief chemist Halcomb Steel Co., Syracuse, N. Y., who called attention to the present marked scarcity of the alloy and asked whether this was due to the close control of the raw material and whether there was any relief in sight.

The author, Mr. Saklatwalla, said that consumption during the war and since had increased and that world deposits were limited, the largest and best being in Peru. All the vanadium in the United States could not supply one-tenth of the country's needs. It was stated that the present shortage was temporary, due to mining and other difficulties in South America, but particularly to transportation problems.

Later in this discussion Geo. L. Norris, metallurgist, Vanadium Corporation of America, New York, made a statement, with the purpose of allaying the fears regarding a future supply, in which he said that the company's new railroad was expected to be in operation by August, so that ore in plenty could be brought down from the Peruvian mountains to the vessels. By that time, because of the measures now being taken, he expected that prompt deliveries of all the vanadium demanded would be possible. As to price, he contended that this had not increased in proportion to tungsten during the war or to many other materials in and out of the steel industry. The old vanadium company had maintained the low price of $2.50 of contained vanadium in the alloy. Since then, because of the war and increased demand then and since, it had advanced but little in proportion to other materials, its present nominal price being $6.25.

Prof. Jos. W. Richards called attention to the credit due the vanadium company for the development work it had done, and said he believed the history of tungsten would be repeated as to the discovery of new deposits.

In response to a question as to whether the early difficulties in the use of the alloy were due to high carbon in the alloy, the carbon coming from carbon reduction, Mr. Saklatwalla said that the early troubles were not due to the presence of carbon; that the aluminum product carries a high percentage of carbon.

G. M. Berry called attention to the higher silicon content of the product now being turned out and asked the reason. In referring to this Mr. Norris said that to meet the present demand it was necessary to produce it rapidly and to use an ore higher in silica than usual. This results in more silicon in the alloy than usual without any attendant harm, except in making high-speed steel containing 2 per cent vanadium in the crucible but not in the electric process. It is possible to flux out the silica in electric practice with no loss of vanadium, and it is being done continually.

Recent Developments in Ferroalloys

"Recent Developments in the Ferroalloy Industry" were presented in abstract by the author, Robert J. Anderson, metallurgist United States Bureau of Mines, Pittsburgh. The paper is a valuable review of the developments during the war and since in the electric phase of the industry. The recent progress in the metallurgy of the ferroalloys is discussed in detail for each of the alloys, including the minor ferroalloys and those of complex composition. The present status of the electric furnace production of ferroalloys in the United States is next considered, together with factors affecting the domestic ferroalloy industry, such as the supply of metallurgical ores, electric power and the location of ferroalloy plants, and the trade situation.

Dr. Colin G. Fink, Chile Exploration Co., New York, was led to gather from Mr. Anderson's paper that the American ferroalloy industry was in danger and asked of whom are we afraid. Can England or Germany compete with us?

Mr. Hardy replied that competition does not come from Europe, but from Canada, where ferrosilicon in particular can be made cheaper and that underselling is felt now from that sources.

Dr. Richards said the situation as to Sweden was similar, where ferrosilicon producers have had to shut down because they could not compete with Canada. The speaker also said that while he was a strong advocate of the electric furnace, he believed that the blast furnace might compete with the electric in making higher silicon alloys by the use of air enriched by oxygen; that 35 per cent and perhaps 50 per cent alloy might be a possibility from the blast furnace.

Electric Ferromanganese at Anaconda

The production of ferromanganese by the electric process was brought before the meeting by a paper, "Ferromanganese," by E. S. Bardwell, Anaconda Copper Mining Co., Anaconda, Mont., which was presented in abstract by Professor Richards. The paper, which will be abstracted in a later issue of THE IRON AGE, is a

detailed account of the Anaconda company's experience in making the alloy late in the war. The plant has a calculated output of 90 tons of 80 per cent alloy per day. There were three furnaces ready to operate at the time of the signing of the armistice, the first one having been started in September, 1918. They operate on 60-cycle, 3-phase, alternating current and have a net efficiency of 71 per cent. Heat losses are 40 per cent, due to radiation, and 60 per cent due to the electrical apparatus. The losses by volatilization are heavy. Of the manganese charged about 74.2 per cent is obtained in the alloy, 2.5 per cent going into the slag and 23.3 per cent not accounted for. The author thinks that the latter loss is explained by the formation of manganese carbonyl, which is volatile.

Edwin F. Cone, associate editor, THE IRON AGE, said that it might be interesting to state that the Anaconda company has again started up this plant, two furnaces now being in operation and a third about ready. He stated that this was made possible by the present high price of the alloy, which is $250 per ton, delivered, for prompt and early delivery and $200 for last half. Because of the industrial uncertainty in 1919, ferromanganese had declined to less than $100 per ton late in the year, and with the close of the year most electrically operated plants had shut down. It was evidently only possible to profitably operate on electricity when the price is high, and it is hardly probable that the electric furnace can compete with the blast furnace on ferromanganese.

Ferrocerium

An interesting paper on ferrocerium was presented by Alcan Hirsch, consulting chemical engineer, New York, who recited the history of the alloy as a pyrophoric material, and furnished details as to its uses. Metallurgically as a deoxidizer, Mr. Hirsch cited Dr. Moldenke's experiments, an account of which appeared in THE IRON AGE, Jan. 29, 1920. In response to a question by H. W. Gillett as to its use in brass and bronze as a deoxidizer, Mr. Hirsch said that great care must be exercised, one company which had thus used it having used too much.

The general subject of the furnace used in manufacturing ferroalloys was introduced by a paper, "The Manufacture of Ferroalloys in the Electric Furnace," by C. B. Gibson, Westinghouse Electric & Mfg. Co., Pittsburgh. This is printed abstracted elsewhere in this issue. The subject, "Fundamental Problems in Alloy Research," was treated by H. E. Howe, vice-chairman, Division of Research, National Research Council, Washington.

Stellite, Nichrome and Other Electric Alloys

Stellite, nichrome and other electrically produced alloys were represented by two papers. The first, "Stellite," by Elwood Haynes, Kokomo, Ind., was presented by Dr. Richards in abstract. The main point is that this alloy is now being made in electric furnaces instead of in crucibles or by any other process. The paper gives an account of the invention of the alloy, its varieties and other details.

Nichrome and several other alloys as made in two Heroult electric furnaces were discussed in a paper, "The Electrical Production of Alloys," by Ralph M. Major, research metallurgist, Driver-Harris Co., Harrison, N. J.

The paper describes some of the many alloys made electrically by this company, and there is a discussion of the general advantages of electric melting as compared with any other. Detailed descriptions are given of the production and properties of Nichrome (Ni-Cr-Fe), Kromore (Ni-Cr), Mangaloy (Ni-Mn), nickel-chromium steel alloys, Climax (nickel steel), and Invar, also a nickel steel.

In response to a question as to how nichrome will wear abrasively at a temperature around 800 deg. C., Mr. Major said that the alloy will not stand much wear. Forged nichrome has a Brinell hardness of 170, which by cold working can be brought up to 255.

Electric High Speed Steel

"The Manufacture of High Speed Steel in the Electric Furnace," by Roy C. McKenna, president Vanadium-Alloys Steel Co., Latrobe, Pa., was the only medium by which ferrotungsten was introduced into the program.

The paper was presented in abstract by the author. It is a description of the advantages of the electric process over others for this purpose. The details of charging, melting, slagging, teeming, forging, heat treatment, etc., are given, and important points in the practice outlined.

In the discussion the question of the percentage of silicon in ferrovanadium came up. George L. Norris, of the Vanadium company, at this point corrected the statement attributed to him of 6 to 10 per cent of silicon as the contents of the alloy. No percentage had been named by him, but he could say that alloy as high as 25 per cent silicon has been successfully used in making high speed steel in electric furnaces.

F. W. Brooke, Industrial Electric Furnace Co., Philadelphia, emphasized the necessity of the use of very pure alloys in making high speed steel, but another important point was to add these alloys or metals to as pure and as well-made a steel as possible.

Dr. Richards called attention to the mixing or stirring effect of the magnetic currents in electric furnaces, an advantage over the crucible, particularly when heavy tungsten is used as in high-speed steel.

Power for Electrochemical and Other Industries

THE session Friday evening, April 9, at the Copley-Plaza Hotel, devoted to a symposium on "Power for Electrochemical Purposes" was presided over by Calvert Townley, president American Institute of Electrical Engineers, the session being a joint one.

Electric Steel Furnaces and the Central Station

"The Electric Furnace and the Central Station," by H. L. Hess, the Hess Steel Corporation, Baltimore, Md., was presented in abstract by the author's father, president of the corporation. The paper gives an account of the development of the electric steel industry, as well as the early experience of Mr. Hess in operating Stassano and other furnaces. He also gives an account of the electrical equipment of the Baltimore plant and how the current is manipulated as received from the power company.

Discussing cold or hot charges for electric furnaces, Mr. Hess discouraged this in the average small plant of to-day, laying stress on the human factor because the use of hot metal enables greater output but also the possibility of the substitution of open-hearth for electric steel or poorly made electric steel. He contended that nothing larger than 8 to 10-ton units are practicable in making good electric alloy steel.

A paper, "The Electric Arc Melting Furnace and the Central Station Electric Company," by Augustus C. Smith, Buffalo General Electric Co., was originally intended for this session, but was not presented until the Saturday morning session through a misunderstanding. Mr. Smith, in his paper, presents a consideration of the effect the arc electric melting furnace has on the power supply, particularly of the surges on the line because of careless handling of the furnace during the melting-down period. Details are given of the abnormal requirements of a number of furnaces. He concludes that unless furnace men are trained to handle the furnaces carefully during the melting-down period, the use of such furnaces on power company supply systems must be limited, because of the abnormal momentary peak currents.

A representative of the Detroit Edison Co., Detroit, Mich., Mr. Noyes, in discussing the paper, said that his company has never found it necessary to restrict the use of electric current by furnaces on its lines. All the furnaces are served by district substations fed by 23,-

600-volt cables. The power feeders for these stations are separate, the steel furnaces being on separate cables. In the case of brass furnaces the load is never heavy enough to cause difficulty.

Furnace Operators and Power Problems

"Power Problems from the Standpoint of the Furnace Operator," by Wallace T. Berlin, electric furnace operator, Taylor-Wharton Iron & Steel Co., High Bridge, N. J., was presented in abstract. The paper is a discussion of the nature of power requirements when melting cold charges in a steel furnace. Different parts of a heat require differing amounts of power to produce different degrees of fluctuations of current. The effect of these on the power bill is considered dividing the latter into "demand" power and "metered" power. The economics of running a large furnace slowly or a small furnace intensely are considered from these standpoints as well as the question of running two furnaces in parallel so as to reduce the "demand" power and of using off-peak power.

Dr. Carl Hering, consulting engineer, Philadelphia, said that some years ago he had pointed out the advantages of operating a small furnace intensely, but that at that time his suggestions were decidedly rejected. He was glad to note its advocacy now.

The quantity of electric power now available at Niagara Falls was put at about 500,000 kw. by a speaker during one of the discussions.

Three interesting papers on sources of power were: "Location for a New England Electrochemical Plant," by C. T. Maynard, engineer, Rumford Falls Power Co., Rumford, Me.; "Water Powers of the Pacific Coast," by F. F. Fowler and "Power Developments in Scandinavia," by J. W. Beckman, metallurgical engineer, San Francisco, Cal.

Self-Baking Electrodes and Electric Brass Melting

TWO important topics which elicited considerable discussion were the features of one of the meetings devoted to general subjects. This was held on Saturday morning, April 10 in the New Lecture Hall of Harvard University, Cambridge. The two principal topics were electrodes and electric furnaces for brass and non-ferrous melting.

Self-Baking Continuous Electrodes

A decidedly novel and interestingly new development was introduced in a paper by Prof. Joseph W. Richards, Lehigh University, on "The Söderberg Self-Baking Continuous Electrode." This paper will be published in part in a later issue of THE IRON AGE but the following extract from the paper presents the idea briefly:

C. W. Söderberg, Christiania, Norway, imagined over 10 years ago a self-baking electrode, formed continuously from soft carbon mixture, which would be baked in the same furnace in which it is used and thus provide a continuous electrode.

The first electrode of this kind was built by Mr. Söderberg in 1909. He naturally met with many difficulties in developing his idea, and it was not until 1915 that he actively pushed the development in connection with the company with which he is now engineer.

After considerable development work, the company succeeded in overcoming in a practical manner all of the difficulties, and in November, 1918, a 400-mm. (16-in.) electrode was operated on a ferromanganese furnace without disturbances to the furnace and with no fracturing of the electrode. Since that time electrodes of all sizes up to 850 mm. (34 in.) diameter have been successfully operated, both in open and closed furnaces, in making ferrosilicon, silicomanganese and ferromolybdenum.

Doctor Richards said he saw last summer a 34-in. electrode of this type operating in a ferrosilicon furnace in Norway, the inventor of the electrode being a personal friend. The electrode is consumed very slowly and takes about a week to bake one meter. The speaker stated that several European firms are soon to make use of this type of electrode.

In the United States the new device is about to be tried out at the Anniston Steel Co., Anniston, Ala., on three furnaces and a representative, Mr. Wesley, of the Norwegian interests is now in this country overseeing the trial. There are to be at Anniston three 32-in. self-baking electrodes on ferrosilicon furnaces and they are expected to be in operation in May. It is stated that any one desiring to see them will have the privilege.

Dr. Colin G. Fink, New York, called attention to some advantages not presented by the author when he said that the new type evidently does away with the transportation problem and the spalling of modern electrodes if not stored properly.

L. E. Saunders, Alundum Co., Niagara Falls, N. Y., asked for information regarding the smoke from the baking of these electrodes and what could be done in case the iron casing used should contaminate the product. To this Dr. Richards replied that the baking is so slow that there is virtually no smoke. What there is seems to be forced down into the interior of the electrode where carbon is perhaps deposited as the smoke comes in contact with the red hot carbon. If applied only to ferroalloys, contamination from the iron casing is out of the question and even in making calcium carbide, it is claimed that the casing introduces no more than 0.20 per cent of iron into the product. Where aluminum is to be refined or melted, an aluminum casing might be used.

Electric Furnaces in the Non-Ferrous Industry

The electric melting of non-ferrous metals was introduced by a paper "The Evolution of the Electric Brass Furnace" by H. M. St. John, sales engineer, Detroit Electric Furnace Co., Detroit, Mich. The paper, which was presented in abstract by Mr. Rhoades of the company, is a consideration of the evolution of the furnace from the standpoint of the survival of the fittest. The various types of brass melting furnaces are discussed under these heads: The induction or direct resistance, in which heat is generated by the direct resistance of the metal itself; indirect resistance where heat is generated in a resistor and transferred by radiation or conduction to the metal to be heated and arc furnaces where the heat is transferred to the metal directly or indirectly by conduction or radiation.

C. A. Winder, General Electric Co., Lynn, Mass., said in opening the discussion that he took issue with the author's statement that as low as 240 kw. hr. per net ton of electrical energy was consumed on yellow brass. This he did not believe possible. He also called attention to the freedom of electric melting from sulphur absorption by the copper which is a serious matter, though he did not think freedom from oxides entirely possible in the practice. He predicted the almost universal use of electric furnaces in this industry and said there was a place for all types.

Edwin L. Crosby, president Detroit Electric Furnace Co. in reply to Mr. Winder stated that there are now 8 to 10 rocking furnaces regularly producing 60-40 brass where the electrical consumption is an average of 240 kw. hr. per ton or less, this average applying to days' runs. In given cases the average is as low as 215 kw. hr. per ton. As to uniformity of temperature, tests of the bath showed a variation of no more than 3 deg. in various parts. H. W. Gillett, inventor of the Detroit Rocking furnace, stated that the American Brass Co. was operating as low as 174 kw. hr. per ton on yellow brass.

T. F. Baily, president Electric Furnace Co., Alliance, Ohio, insisted that, while his furnaces were not doing much better than 285 kw. hr. per ton, the electrical consumption was a secondary consideration. More important are life of linings, upkeep, metal losses, etc. In his case metal losses ran from 0.75 to 1 per cent.

As an indication of the growth of this industry, Edwin F. Cone, associate editor, THE IRON AGE, New York, called attention to data published in THE IRON AGE, March 4, 1920, which revealed 260 to 265

furnaces of all types operating as of March 1 in the non-ferrous industry of the United States and that this development had taken place largely in the last two years. As compared statistically with the steel furnaces, there had been 323 furnaces installed in the steel industry in the seven years ended with 1919. Since the data referred was published the total number of electric furnaces operating on non-ferrous metals has increased to approximately 300.

Pig Iron from Steel Scrap

Synthetic pig iron or iron made from steel scrap in the electric furnace was the subject of a paper, "Synthetic Electric Furnace Pig Iron" by Charles A. Keller, managing director, Keller & Leleux, Paris, France. This was presented as an abstract by Doctor Richards who translated it. The paper is substantially the same as the one by the same author, presented last fall at Iron and Steel Institute in London and abstracted in THE IRON AGE, Jan. 29, 1920.

A contribution to the discussion was offered by F. W. Brooke, Electric Furnace Construction Co., Philadelphia, who testified that his experience in making this iron by this process was the difficulty in securing any higher carbon content than 2.75 to 3.20 per cent. While this was easily accomplished, to get 3.75 per cent was seriously difficult, especially where a roof was used on the furnace. Doctor Richards said that in France there had been no difficulty in getting 3 per cent carbon in open furnaces.

Electric Furnaces in Steel Metallurgy

"The Position of the Electric Furnace in Iron and Steel Metallurgy" was discussed by Lewis B. Lindemuth, consulting metallurgist, New York, the author presenting the paper in abstract. Mr. Lindemuth, offers a detailed comparison between the physical and chemical characteristics and phenomena of the four standard steel-making processes and deprecates undue praise and claim for the electric furnace. Its advantages are minutely discussed with the conclusion that "when properly installed and operated, it is metallurgically the best steel making apparatus on hand and economically the cheapest."

F. W. Brooke rose in protest to one statement of the author—that electric furnace designers and builders are for the most part not very familiar with their operation. Mr. Brooke cited the Heroult, the Rennerfelt and the Greaves-Etchells in particular, as all backed by salesmen and technical staffs of wide and large experience in practical operations.

Doctor Richards suggested that the author had been too modest in his claims for the electric process. It was the speaker's belief that the great field for the electric furnace in the future is to be in duplexing and triplexing and that in a few years electric furnaces will be a part of the equipment of all steel plants.

A paper by Philip B. Short, general engineer Westinghouse Electric & Mfg. Co., Pittsburgh, entitled "Stop Induction Regulator for Electric Furnaces" was presented in abstract. It is a description of the most recent development in electrical control equipment for such furnaces and consists of a combination induction-type regulator, a selected switch, a transfer switch, a series transformer and a suitable panel for meters and switches. Twenty electric zinc furnaces in Norway are to use this equipment. L. E. Saunders, the Norton Co., Niagara Falls, congratulated the inventor on the importance of the device and the results obtainable in achieving a great saving in cost.

This general session was welcomed to Harvard by Prof. T. W. Richards, professor of chemistry, who after the meeting, escorted the members through the laboratories, previous to a luncheon at the Harvard Union.

Session on General Topics

One of the sessions on more general topics was held on Thursday afternoon in one of the halls of the impressive buildings of the Massachusetts Institute of Technology. After this session the guests were taken through the various laboratories of the institute.

Corrosion of Wrought Iron

The familiar problem of iron corrosion was brought before the convention by a paper, "Influence of Inclosed Slag on the Corrosion of Wrought Iron" by L. T. Richardson, chemical engineer, New Brunswick, N. J. An abstract will appear in a later issue. The author concludes that any superior resistance to corrosion that wrought iron may have is not due to slag inclusions but to some other cause, among which is the purity of the iron.

Dr. Allerton Cushman in discussing the paper said that he had made many researches on the effect of slag and agreed with the author in many points. He introduced Mr. Aupperle of the American Rolling Mill Co., Middletown, Ohio, who threw on the screen several views and analyses of old irons which showed particularly that the low quantities of nitrogen and oxygen were synonymous with freedom from corrosion and that in all cases but little slag was present.

New Way to Analyze Carbon in Steel

A new method for determining carbon in iron was presented by T. D. Yensen, Westinghouse Research Laboratory, Pittsburgh, in a paper, "Carbon in Iron" which he presented in abstract. Briefly the paper stated that:

> The ordinary method of determining carbon in iron and steel consists in burning the sample with free oxygen, absorbing the CO_2 by means of KOH and weighing the KOH bulb before and after. In order to eliminate the errors due to absorption and weighing, the new method substitutes freezing out the CO_2 with liquid air and allowing it to expand into a known volume and noting the increase in pressure. In order to differentiate between the carbon existing as absorbed CO or CO_2 and that existing in combined form, the method involves two heatings, one to 600 deg. C. in vacuo, and the other to 1000 deg. or higher in oxygen. Extra precautions are also taken to eliminate errors due to other sources, so that by this method carbon can, if necessary, be determined with an accuracy of $\pm$ 0.0001 per cent.

In the discussion Dr. Allerton Cushman pronounced the method a most interesting and valuable one in that it enabled an operator to determine separately the different conditions in which carbon exists in the iron or steel—a most desirable matter—and to do it accurately. There seemed also the possibility of determining all gases which to-day are regarded as having so important an influence on the properties of metals.

Cleaning and Pickling of Carbon Steels

An interesting paper on "The Embrittling Effect of Cleaning and Pickling upon Carbon Steels," by S. C. Langdon and M. A. Grossman, both formerly with the United States Bureau of Standards, was presented in abstract. The paper deals with effects of cleaning, sand-blasting and of pickling with sulphuric acid and with various acid solutions such as nitre cake, hydrofluoric acid, hydrochloric acid and nitric acid. The effects of various treatments after pickling are discussed. The extent of brittleness was determined by the Erichsen tests.

In general it was demonstrated that mechanical treatment such as sand-blasting rendered the metal less strong because of the formation of uneven surfaces. This was also true of nitric acid pickling. In other cases where hydrogen was formed this gas tended to cause temporary brittleness which could be removed on allowing the sheets to stand or by heating them or plunging them in boiling water.

Dr. Cushman also spoke on this subject, saying that the suggestions of the authors all point to the effect of gases in steel. He raised the question whether, in making tin plate, it was not likely that the pin holes sometimes found were due to the presence of hydrogen in the base plate after pickling, particularly if this plating was done at once. He also called attention to the interesting fact that while hydrogen absorption from pickling seems to embrittle steel, annealing steel in an atmosphere of hydrogen renders it soft. Dr. W. D. Bancroft's explanation for the latter phenomenon was that larger crystals were thus caused.

Excursions and New Officers

The society's regular smoker on Thursday evening was held at the interesting research laboratories of the Arthur D. Little, Inc., Cambridge. These were open

to inspection, a feature being the operation of a paper mill which is now making commercially a special brand of filter paper.

A large number of the members made an excursion to the plant of the General Electric Co., Lynn, Mass., as guests of the company, on Friday afternoon.

Officers for the next year were elected as follows: President, W. S. Landis, American Cyanamid Co., New York; vice-presidents, Dr. John A. Mathews, vice-president Crucible Steel Co. of America, Pittsburgh; L. E. Saunders, the Norton Co., Niagara Falls, N. Y.; A. T. Hinckley, National Carbon Co., Niagara Falls; managers, Dr. Colin G. Fink, Chile Exploration Co., New York; Acheson Smith, Acheson Graphite Co., Niagara Falls, N. Y.; H. B. Coho, United Lead Co., New York; treasurer, P. G. Salom, Philadelphia, and secretary, Prof. J. W. Richards, Lehigh University, Bethlehem, Pa.

The Electric Furnace Association

The Electric Furnace Association held its regular spring meeting simultaneously with the other two organizations. The principal session was on Thursday afternoon, April 9. The topic for discussion was, "Adequately Trained Men for the Electric Furnace Industry."

Acheson Smith, president Acheson Graphite Co., Niagara Falls, N. Y., read a paper on this subject, in which he outlined the importance of electric steel and electric furnaces, illustrating this by the American and world output and the number of furnaces in existence. He discussed the rôle of the melter or furnace operator on electric steel and the great need for such men. Among possible solutions of the problem of obtaining properly trained men, Mr. Smith suggested the following:

The universities are providing technical courses to fit their graduates for electrical engineering and metallurgical work and undoubtedly some of them are teaching the principles involved in the use of the electric furnace, but there seems to be a very serious lack of practical training for men to fit them to properly hold positions with companies operating such furnaces.

To give students a thorough working knowledge of the design and operation of electric furnaces, faculties will undoubtedly adopt different methods. It might be done by operating small furnaces in the university laboratories, and thus giving the students some practical training. It might be accomplished by adding to their theoretical studies visits to plants operating different types of electric furnaces. Perhaps extension work could be arranged whereby the student could work for several months in plants operating electric furnaces and be given credit in the university for such work. It is possible that practical training could be given as graduate work for a higher degree which, of course, would have some advantages. It is possible that some institutions of learning will be able to install furnaces of each distinct type for producing steel, brass and for heat treating, and thus be able to give their students a thorough practical training in the operation of each type of electric furnace.

Following Mr. Smith's paper, written discussions of the subject were presented as prepared by H. G. Weidenthal, James H. Herron Co., Cleveland; Prof. Joseph W. Richards, Lehigh University, Bethlehem, Pa.; Dr. F. A. J. FitzGerald, FitzGerald Laboratories, Niagara Falls, N. Y.; L. G. Pritz, Timken Roller Bearing Co., Detroit, Mich.; E. T. Moore, Halcomb Steel Co., Syracuse, N. Y.; Prof. D. R. Sweeney, University of Cincinnati, Cincinnati, Ohio; L. B. Lindemuth, Carney & Lindemuth, New York; John Howe Hall, Taylor-Wharton Iron & Steel Co., High Bridge, N. J.; Prof. Peter Christiansen, University of Minnesota; Jesse L. Jones, Westinghouse Electric & Mfg. Co., Pittsburgh, and Col. W. H. Walker, Massachusetts Institute of Technology, Boston.

The following officers were elected for the succeeding year: Acheson Smith, president; C. H. Booth and H. L. Hess, vice-presidents; C. G. Schluederberg, secretary, and F. J. Ryan, treasurer, with F. J. Tone and H. G. Weidenthal, directors for two years.

EUROPE BUYS FOUNDRY IRON

Orders Come from Britain, Italy and Sweden—With Speculators Out, Japanese Orders Decline

While inquiries and orders from Japan are reduced to a few from the large consumers of iron and steel, the European markets begin to show more signs of life than at any time this year. Despite the depressed condition in Japanese buying, exporters report numerous rail orders, one having sold 1200 tons of 60-lb. rails promised for June delivery and already shipped, and another having booked an order for 1450 tons of 18-lb. rails for third quarter delivery. Much of the material now being moved being on orders placed with mills last fall at lower prices, the tendency of the buyer is to hold back at the prevailing higher prices. Most exporters look upon the present condition as nearer normal than the recent heavy purchasing, which was to a large extent by speculators, who were reselling at an abnormal profit. As an example, rails costing $100 per ton put down in Japan were resold at from $140 to $150 per ton.

A Japanese export house during the past week booked an order for 20,000 boxes of tinplate at a good price for third and fourth quarter delivery.

In the European markets business is being done with England, Scotland, Sweden, Belgium, Holland and Italy. One exporter reports a sale of 1000 tons of foundry iron to a steel company in Scotland, a smaller amount to Sweden and 1000 tons of foundry iron to an Italian concern for shipment to Genoa. The order from Scotland was placed at a good price because of the promise of delivery by May 10. This seller has shipped several small orders of spiegeleisen to Belgium, Holland and England at $70 and $71 per ton, c.i.f. the foreign port.

Although South American markets continue to purchase at the same time that they are objecting to the high prices, some of the business is apparently finding its way into British hands, the buyer being willing to accept rather uncertain delivery with compensation in lower prices.

England is conspicuous as a seeker of ship material. It is possible that as much as 100,000 tons could be sold if obtainable for relatively early delivery. On a lot of 600 tons a premium of close to 10 per cent was offered for July shipment and twice the bonus if shipments could be made in June. Another case is noted of an offer of $5 a ton premium for July shipment.

An export sale has been made of 2000 tons of plates at 3.95c., Pittsburgh basis, thus $1 a ton under the price at which much of the business has lately been done, and 10,000 tons are still under consideration.

Active negotiations are under way on a sale to England of 5000 tons of basic iron. In one case a bid of $45 has been made.

Argentina offers a good field for the sale of construction material, according to a report of the Bureau of Foreign and Domestic Commerce, Washington, Special Agents' Series, No. 188. Buenos Aires, the report says, is in need of first class office buildings, hotels and apartment houses and with a return to normal conditions model homes for workers will be erected in the suburbs of the city. A building program for schools has been adopted by the National Council of Education, which plans an expenditure of about $8,500,000 and for sewerage and water systems alone the National Government plans to expend about $10,000,000 in the near future.

A very instructive address on the subject "Selecting the Babbitt" was delivered before the Automotive Service Association, on Tuesday last, by H. S. Hood of the United American Metals Corporation, maker of Syracuse babbitts. This address is being printed and copies may be obtained by those interested in the above subject directing their requests to the United American Metals Corporation, Diamond Street and Meserole Avenue, Brooklyn, N. Y.

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Session on General Topics

One of the sessions on more general topics was held on Thursday afternoon in one of the halls of the impressive buildings of the Massachusetts Institute of Technology. After this session the guests were taken through the various laboratories of the institute.

Corrosion of Wrought Iron

The familiar problem of iron corrosion was brought before the convention by a paper, "Influence of Inclosed Slag on the Corrosion of Wrought Iron" by L. T. Richardson, chemical engineer, New Brunswick, N. J. An abstract will appear in a later issue. The author concludes that any superior resistance to corrosion that wrought iron may have is not due to slag inclusions but to some other cause, among which is the purity of the iron.

Dr. Allerton Cushman in discussing the paper said that he had made many researches on the effect of slag and agreed with the author in many points. He introduced Mr. Aupperle of the American Rolling Mill Co., Middletown, Ohio, who threw on the screen several views and analyses of old irons which showed particularly that the low quantities of nitrogen and oxygen were synonymous with freedom from corrosion and that in all cases but little slag was present.

New Way to Analyze Carbon in Steel

A new method for determining carbon in iron was presented by T. D. Yensen, Westinghouse Research Laboratory, Pittsburgh, in a paper, "Carbon in Iron" which he presented in abstract. Briefly the paper stated that:

> The ordinary method of determining carbon in iron and steel consists in burning the sample with free oxygen, absorbing the CO_2 by means of KOH and weighing the KOH bulb before and after. In order to eliminate the errors due to absorption and weighing, the new method substitutes freezing out the CO_2 with liquid air and allowing it to expand into a known volume and noting the increase in pressure. In order to differentiate between the carbon existing as absorbed CO or CO_2 and that existing in combined form, the method involves two heatings, one to 600 deg. C. in vacuo, and the other to 1000 deg. or higher in oxygen. Extra precautions are also taken to eliminate errors due to other sources, so that by this method carbon can, if necessary, be determined with an accuracy of $\pm$ 0.0001 per cent.

In the discussion Dr. Allerton Cushman pronounced the method a most interesting and valuable one in that it enabled an operator to determine separately the different conditions in which carbon exists in the iron or steel—a most desirable matter—and to do it accurately. There seemed also the possibility of determining all gases which to-day are regarded as having so important an influence on the properties of metals.

Cleaning and Pickling of Carbon Steels

An interesting paper on "The Embrittling Effect of Cleaning and Pickling upon Carbon Steels," by S. C. Langdon and M. A. Grossman, both formerly with the United States Bureau of Standards, was presented in abstract. The paper deals with effects of cleaning, sand-blasting and of pickling with sulphuric acid and with various acid solutions such as nitre cake, hydrofluoric acid, hydrochloric acid and nitric acid. The effects of various treatments after pickling are discussed. The extent of brittleness was determined by the Erichsen tests.

In general it was demonstrated that mechanical treatment such as sand-blasting rendered the metal less strong because of the formation of uneven surfaces. This was also true of nitric acid pickling. In other cases where hydrogen was formed this gas tended to cause temporary brittleness which could be removed on allowing the sheets to stand or by heating them or plunging them in boiling water.

Dr. Cushman also spoke on this subject, saying that the suggestions of the authors all point to the effect of gases in steel. He raised the question whether, in making tin plate, it was not likely that the pin holes sometimes found were due to the presence of hydrogen in the base plate after pickling, particularly if this plating was done at once. He also called attention to the interesting fact that while hydrogen absorption from pickling seems to embrittle steel, annealing steel in an atmosphere of hydrogen renders it soft. Dr. W. D. Bancroft's explanation for the latter phenomenon was that larger crystals were thus caused.

Excursions and New Officers

The society's regular smoker on Thursday evening was held at the interesting research laboratories of the Arthur D. Little, Inc., Cambridge. These were open

to inspection, a feature being the operation of a paper mill which is now making commercially a special brand of filter paper.

A large number of the members made an excursion to the plant of the General Electric Co., Lynn, Mass., as guests of the company, on Friday afternoon.

Officers for the next year were elected as follows: President, W. S. Landis, American Cyanamid Co., New York; vice-presidents, Dr. John A. Mathews, vice-president Crucible Steel Co. of America, Pittsburgh; L. E. Saunders, the Norton Co., Niagara Falls, N. Y.; A. T. Hinckley, National Carbon Co., Niagara Falls; managers, Dr. Colin G. Fink, Chile Exploration Co., New York; Acheson Smith, Acheson Graphite Co., Niagara Falls, N. Y.; H. B. Coho, United Lead Co., New York; treasurer, P. G. Salom, Philadelphia, and secretary, Prof. J. W. Richards, Lehigh University, Bethlehem, Pa.

The Electric Furnace Association

The Electric Furnace Association held its regular spring meeting simultaneously with the other two organizations. The principal session was on Thursday afternoon, April 9. The topic for discussion was, "Adequately Trained Men for the Electric Furnace Industry."

Acheson Smith, president Acheson Graphite Co., Niagara Falls, N. Y., read a paper on this subject, in which he outlined the importance of electric steel and electric furnaces, illustrating this by the American and world output and the number of furnaces in existence. He discussed the rôle of the melter or furnace operator on electric steel and the great need for such men. Among possible solutions of the problem of obtaining properly trained men, Mr. Smith suggested the following:

The universities are providing technical courses to fit their graduates for electrical engineering and metallurgical work and undoubtedly some of them are teaching the principles involved in the use of the electric furnace, but there seems to be a very serious lack of practical training for men to fit them to properly hold positions with companies operating such furnaces.

To give students a thorough working knowledge of the design and operation of electric furnaces, faculties will undoubtedly adopt different methods. It might be done by operating small furnaces in the university laboratories, and thus giving the students some practical training. It might be accomplished by adding to their theoretical studies visits to plants operating different types of electric furnaces. Perhaps extension work could be arranged whereby the student could work for several months in plants operating electric furnaces and be given credit in the university for such work. It is possible that practical training could be given as graduate work for a higher degree which, of course, would have some advantages. It is possible that some institutions of learning will be able to install furnaces of each distinct type for producing steel, brass and for heat treating, and thus be able to give their students a thorough practical training in the operation of each type of electric furnace.

Following Mr. Smith's paper, written discussions of the subject were presented as prepared by H. G. Weidenthal, James H. Herron Co., Cleveland; Prof. Joseph W. Richards, Lehigh University, Bethlehem, Pa.; Dr. F. A. J. FitzGerald, FitzGerald Laboratories, Niagara Falls, N. Y.; L. G. Pritz, Timken Roller Bearing Co., Detroit, Mich.; E. T. Moore, Halcomb Steel Co., Syracuse, N. Y.; Prof. D. R. Sweeney, University of Cincinnati, Cincinnati, Ohio; L. B. Lindemuth, Carney & Lindemuth, New York; John Howe Hall, Taylor-Wharton Iron & Steel Co., High Bridge, N. J.; Prof. Peter Christiansen, University of Minnesota; Jesse L. Jones, Westinghouse Electric & Mfg. Co., Pittsburgh, and Col. W. H. Walker, Massachusetts Institute of Technology, Boston.

The following officers were elected for the succeeding year: Acheson Smith, president; C. H. Booth and H. L. Hess, vice-presidents; C. G. Schluederberg, secretary, and F. J. Ryan, treasurer, with F. J. Tone and H. G. Weidenthal, directors for two years.

EUROPE BUYS FOUNDRY IRON

Orders Come from Britain, Italy and Sweden—With Speculators Out, Japanese Orders Decline

While inquiries and orders from Japan are reduced to a few from the large consumers of iron and steel, the European markets begin to show more signs of life than at any time this year. Despite the depressed condition in Japanese buying, exporters report numerous rail orders, one having sold 1200 tons of 60-lb. rails promised for June delivery and already shipped, and another having booked an order for 1450 tons of 18-lb. rails for third quarter delivery. Much of the material now being moved being on orders placed with mills last fall at lower prices, the tendency of the buyer is to hold back at the prevailing higher prices. Most exporters look upon the present condition as nearer normal than the recent heavy purchasing, which was to a large extent by speculators, who were reselling at an abnormal profit. As an example, rails costing $100 per ton put down in Japan were resold at from $140 to $150 per ton.

A Japanese export house during the past week booked an order for 20,000 boxes of tinplate at a good price for third and fourth quarter delivery.

In the European markets business is being done with England, Scotland, Sweden, Belgium, Holland and Italy. One exporter reports a sale of 1000 tons of foundry iron to a steel company in Scotland, a smaller amount to Sweden and 1000 tons of foundry iron to an Italian concern for shipment to Genoa. The order from Scotland was placed at a good price because of the promise of delivery by May 10. This seller has shipped several small orders of spiegeleisen to Belgium, Holland and England at $70 and $71 per ton, c.i.f. the foreign port.

Although South American markets continue to purchase at the same time that they are objecting to the high prices, some of the business is apparently finding its way into British hands, the buyer being willing to accept rather uncertain delivery with compensation in lower prices.

England is conspicuous as a seeker of ship material. It is possible that as much as 100,000 tons could be sold if obtainable for relatively early delivery. On a lot of 600 tons a premium of close to 10 per cent was offered for July shipment and twice the bonus if shipments could be made in June. Another case is noted of an offer of $5 a ton premium for July shipment.

An export sale has been made of 2000 tons of plates at 3.95c., Pittsburgh basis, thus $1 a ton under the price at which much of the business has lately been done, and 10,000 tons are still under consideration.

Active negotiations are under way on a sale to England of 5000 tons of basic iron. In one case a bid of $45 has been made.

Argentina offers a good field for the sale of construction material, according to a report of the Bureau of Foreign and Domestic Commerce, Washington, Special Agents' Series, No. 188. Buenos Aires, the report says, is in need of first class office buildings, hotels and apartment houses and with a return to normal conditions model homes for workers will be erected in the suburbs of the city. A building program for schools has been adopted by the National Council of Education, which plans an expenditure of about $8,500,000 and for sewerage and water systems alone the National Government plans to expend about $10,000,000 in the near future.

A very instructive address on the subject "Selecting the Babbitt" was delivered before the Automotive Service Association, on Tuesday last, by H. S. Hood of the United American Metals Corporation, maker of Syracuse babbitts. This address is being printed and copies may be obtained by those interested in the above subject directing their requests to the United American Metals Corporation, Diamond Street and Meserole Avenue, Brooklyn, N. Y.

NEW DROP FORGING PLANT

Liberal Provision of Doors and Windows and Depressed Freight Siding Among Features

The Storms Drop Forging Co., recently incorporated under Massachusetts laws with a capital of $550,000, expects to have its Springfield plant ready for equipment installation by June and in operation the following month. The plant and land represent a total estimated investment of $175,000. There are nine acres bounded by Cottage Street, the Athol branch of the Boston & Albany Railroad, the property of the Atlantic Refining Co., Page Boulevard, and the property of the New England branch of the Westinghouse Electric & Mfg. Co. The Springfield Street Railway runs to within 100 ft. or so of the plant. The Hampton Railroad, within stone throw of the Storms Drop Forging plant, will, if released from litigation and put in operation, benefit the company. The plant is composed of a drop shop, a machine shop and a boiler house. Sixteen years ago Frank F. Storms, president, organized the Page-Storms Drop Forging Co. Some time ago he withdrew.

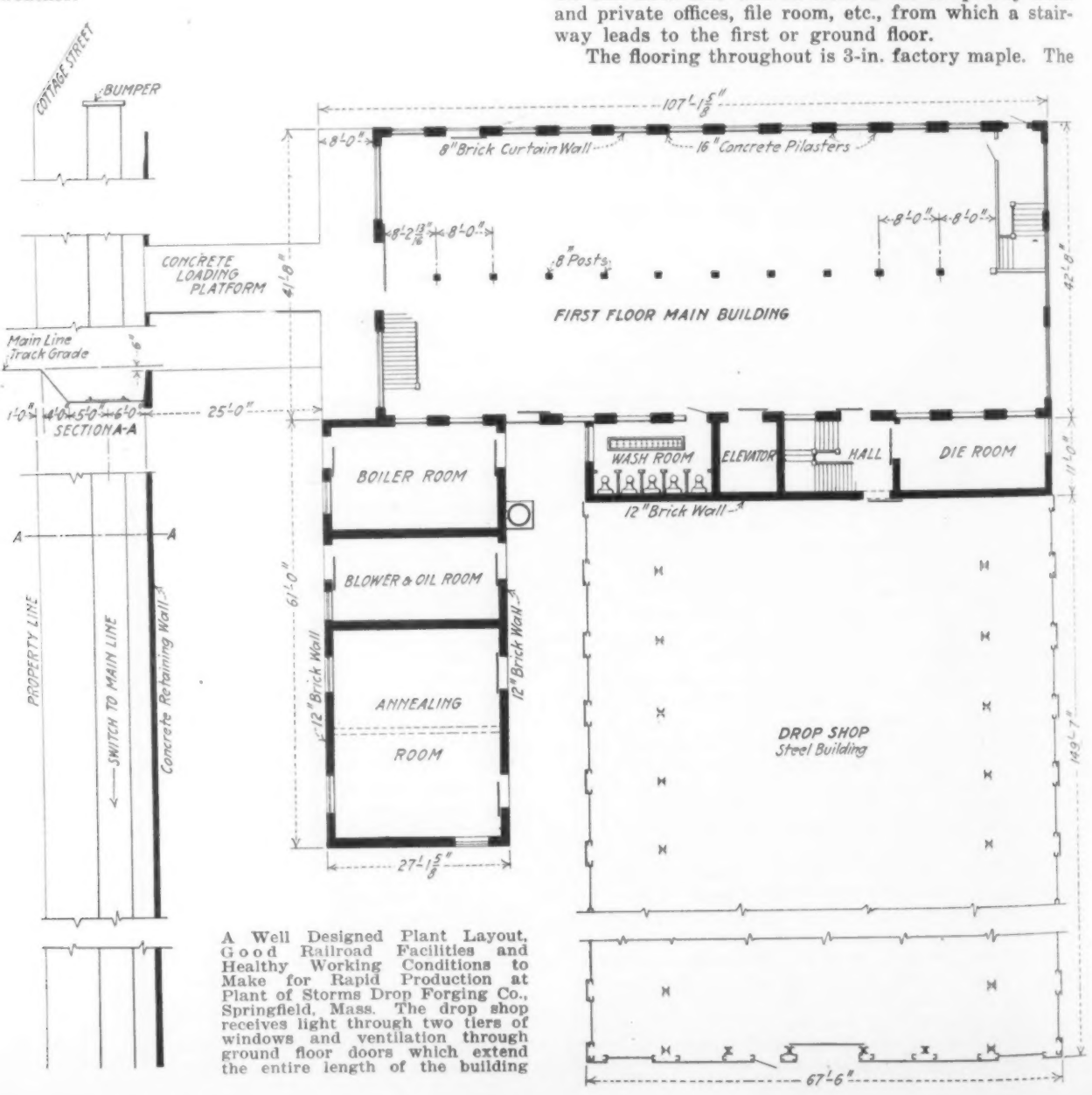
The new drop shop has an all-steel monitor roof, is 67 x 150 ft. in plan and 42 ft. high. At the top windows will be operated mechanically. There is a second tier of large windows below, 30 of them on each side of the building. The ground floor doors extend the entire length of the building and can be opened to provide cool working conditions in hot weather.

All work in the drop shop will be handled on one floor. The estimated cost of the building is $35,000. It will be equipped with 30 drops, ten trip hammers and 12 presses. No cranes are regarded as necessary. Between the drop shop and machine shop a storage die room is located, supplied with racks, which will be numbered for classification, etc. In close proximity is an electric elevator operating to the second floor of the machine shop, as well as stairway, where will be located a second die room for the convenience of the machine shop.

The machine shop, or main building as it is called, is approximately 43 x 107 ft., two stories, constructed of concrete pilasters having concrete caps and brick curtain walls with tile coping. Its three exposed sides are mostly of steel sash glass windows with concrete caps and sills. The estimated construction cost of the machine shop is $35,000. On the ground floor will be eight trimming presses for cold steel work, as well as wood-working machinery for drop boards, shipping boxes, etc. A part of this floor will be used as the shipping department, from which a door leads to a concrete loading platform with pier. The siding connecting with the railroad is of sufficient length to allow gradual depression so that the car floor is even with the concrete loading pier. Electric trucks will operate throughout the machine shop.

The second floor of the main building will be known as the tool and die sinking department and will be equipped with lathes, shapers, planers, drills, die sinking machines, universal miller, a large surface grinder, in fact with all modern tools for die sinking purposes. On this floor also will be located the temporary main and private offices, file room, etc., from which a stairway leads to the first or ground floor.

The flooring throughout is 3-in. factory maple. The



A Well Designed Plant Layout, Good Railroad Facilities and Healthy Working Conditions to Make for Rapid Production at Plant of Storms Drop Forging Co., Springfield, Mass. The drop shop receives light through two tiers of windows and ventilation through ground floor doors which extend the entire length of the building

roof is supported by wood girders. A third stairway leads from the second floor down to the shipping door. The three stairways provide for quick access to safety in case of fire. This main building is so constructed that 100 ft. or more of floor space can be added any time desired without interruption to operations and output, and it is the intention of the management eventually to construct a separate administration building.

The cost of the boiler house, 27 x 61 ft., will run close to $8,000. It will be equipped with a 150-hp. 72-in. boiler manufactured by the D. M. Dillon Steam Boiler Works, Fitchburg, Mass., and an oil-heating system for low and high gravity oil. The oil system will apply to fans and pumps as well. The blower and oil room is located next the boiler room.

Adjoining the blower and oil room is the annealing room, equipped with a double 48 x 75-in. furnace and two heat-treating tanks. The boiler house originally butted on one end of the machine shop or main building, but the management has decided to build it with a 10-ft. runway between the machine and drop shops.

Running diagonally across the company's nine acres of land is a brook which, when dammed, will provide water for the plant. City water will be used throughout, but largely as an auxiliary for the company's own supply. The machine shop will be supplied from a water tank on the roof.

For the present all steel consumed will be stacked in the open between the drop forge and the railroad siding within easy access of the former. It is intended to build a steel shed, located where the steel is stacked to-day, with a railroad siding running through its center to provide for unloading by an electric crane.

The company expects to begin business with 125 to 150 men on its payroll. The officers are: Frank F. Storms, president and general manager; Charles H. Leonard, treasurer, formerly treasurer of the Page-Storms Drop Forging Co.; Albert J. Storms, superintendent. These officers and Frank S. Titchener, Union Forging Co., Union, N. Y.; George A. MacDonald, president Chicopee National Bank, Springfield, Mass.; Capt. Ralph E. Whittle and John Porter constitute the board of directors.

SHIPPING POLICY

Conference of Business Men Called to Consider Knotty Problems

WASHINGTON, April 13.—Admiral W. S. Benson, the new chairman of the Shipping Board, is preparing to take up the knotty problem involving the sale of the Government ships. The efforts of John Barton Payne, former chairman of the board, to reach a solution of the question, brought down upon him considerable abuse, and when he left the board to become Secretary of the Interior little real progress had been made toward the disposal of the ships.

Admiral Benson has called a conference of 17 prominent business men, to be held on April 15. Those summoned to the conference represent basic industries which merchandise from $15,000,000,000 to $18,000,000,000 worth of American products a year. Their views will be sought from the standpoint of men who are interested in maintaining commercial relations with other countries, and, as a means to that end, desire building up a permanent merchant marine. The call for the conference states that two general questions are to be discussed. One is the method, price and terms of the sale of the ships to private owners, and the other is the operation of the fleet, pending its sale and disposition.

Among those invited to attend the conference is James A. Farrell of the United States Steel Corporation. Others include Samuel P. Bush, Buckeye Foundries Co., Columbus, Ohio; James Bell, Washburn-Crosby Co., Minneapolis, Minn.; Charles Dawes, Central Trust Co., Chicago; James N. Gunn, U. S. Tire Co., New York; Edward N. Hurley, Hurley Machine Co., Chicago; Alex Legg, International Harvester Co., Chicago; Charles H. McDowell, Armour Fertilizer Co., Chicago; H. L. McClaren, McClaren Rubber Co., Charlotte, N. C.; Eugene Meyer, director War Finance Corporation, Washington; John Barton Payne, Secretary of the Interior, Washington; Arthur Phelps, general sales manager, Dodge Motor Co., Detroit; George H. Peak, Moline Plow Co., Moline, Ill.; Julius Rosenwald, Sears, Roebuck & Co., Chicago; Fred Vogel, Sr., Pfister-Vogel Leather Co., Milwaukee, Wis.; Fred H. Wells, Peavey Elevator Co., Minneapolis; Owen Young, General Electric Co., Schenectady; C. B. Warren, Detroit.

Although a subcommittee of the Senate Commerce Committee has been working for some time on the drafting of merchant marine legislation, it is considered rather doubtful if any important measure along this line will be enacted at this session of Congress. Only six or seven weeks remain before the recess planned in advance of the national political conventions. The appropriation bills must be disposed of before that time, which will mean that few other measures of importance will receive consideration. It is doubtful whether an adjournment will be taken in June or whether Congress will recess for a period of two or three months. Even if sessions are held in the late summer and fall, it is quite likely to be the disposition to postpone the determination of permanent merchant marine policy until after the Presidential election. In the meantime, the President will dictate the policies of the Shipping Board.

Referendum on Proposed Federal Department of Public Works

WASHINGTON, April 12.—The United States Chamber of Commerce has submitted to its 1305 member organizations the question of approving the proposal to establish a Federal Department of Public Works with a membership in the President's Cabinet. The result will be watched with interest by the iron and steel industry because of its importance to the entire construction program of the Government. Considerable propaganda has already been made in behalf of the proposal which is fathered by the Engineering Council. The result of the referendum will determine the attitude of the National Chamber on this question when Congress reaches the Jones-Reavis bill, now pending.

The referendum presents the following questions:

1. Shall there be established by the National Government a Department of Public Works?
2. Shall such department be established by a suitable modification of the existing Department of the Interior excluding therefrom the non-related bureaus or offices and by the change of name of the Department of the Interior to the Department of Public Works?
3. Shall such department be established by the creation of an entirely new department?

The Jones-Reavis bill provides that the name of the executive department at present designated as the "Department of the Interior" be changed to the name of "Department of Public Works," and that the head thereof shall continue to be a member of the Cabinet under the official designation "Secretary of Public Works."

This bill would transfer much of the work now transacted by Bureaus under the Department of the Interior to other departments and would also place additional bureaus under the new department.

The committee appointed by the chamber in making its recommendation did not pass upon the merits of the proposals embodied in the Jones-Reavis bill. Instead it submitted the three propositions for a referendum vote, one of which calls for an independent Department of Public Works.

Exports or iron ore from Algeria in 1919 were 782,805 tons as compared with 759,217 tons and 1,065,512 tons in 1918 and 1917 respectively, according to *L'Echo des Mines*.

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Facing Facts as to Production

That there has been a decided increase in production in many manufacturing plants is well known, though estimates as to the percentage of decrease vary considerably. An investigation of 40 New England mills and factories by a banking interest said to have excellent opportunities for accurate information shows that the lowering of pre-war standards of per capita production in three important industries in the United States is about 15 per cent. Other estimates of various industries are 25 to 30 per cent and an interesting controversy at the plant of the Morse Chain Co., Ithaca, N. Y., has revealed a considerably greater disparity than that indicated by the New England investigation.

The employees of the Morse company felt that their working days should be shorter. They wanted a nine-hour day instead of a ten-hour day, without a reduction of wages. They proceeded in a much more reasonable manner than many workingmen are doing nowadays. They called shop meetings, talked over conditions among themselves and appointed a shop committee to take up the matter with the company representatives. At the joint conference the exact facts were revealed. The company demonstrated that production at the plant had been decreasing steadily since 1917, and that this decrease was reaching a point where it would be impossible to increase wages. It was shown that the output per man was 36 per cent below the output of 1917 as to the whole plant, while in the foundry there was a 44 per cent drop in production. These figures were startling to the men, who consented to a compromise on the basis of a nine and a half-hour day. Hope is entertained that they will see the imperative necessity of increasing production.

The Ithaca experience demonstrates that it is worth while to bring employees face to face with the facts, which, while they have known them in a general way, they have by no means realized in their bearing upon wage demands. It ought not to be difficult to show that a continuation of the slacking of the last two years will end in bringing this country to the very low rate of production which now prevails in Germany, Great Britain and other European countries in which industrial conditions are extremely serious. The trouble is that so many employees will not be reasoned with after the Ithaca way, but rush ahead under radical influence, giving no opportunity for deliberate consideration.

Conservatism Overdone

The photostat has come to be an instrument which minimizes the possibility of long retaining manufacturing secrets. Yet there are still manufacturers who are over-hesitant in the matter of allowing publication of even the major features of a design, let alone the details. The attitude is that publicity puts a premium on copying designs, because it facilitates the copying of a final product which has represented the expenditure of much time and money; and this view often prevails over the broad claim of the engineering world upon the workers in it, for some contribution to the common fund of knowledge.

It always has been true to a greater or less extent that what one regards as secret is fairly well understood by his competitors. Many are the stories of pilfered blueprints in the hands of a competitor's employees. Human nature has not changed radically, and the photostat, so much more easily obtained, has taken the place of the blueprint.

Given a set of photographs, the capable designer, if he chooses, may develop a respectable imitation of the original if he has in his possession a fairly good complement of photostats. It is a wise concern which, fully recognizing this fact, is willing to allow the light of publicity to shine on its major works. It does not need to divulge the very latest steps it has taken. What frankness in a producing company really does, in contributing to the literature of its industry, is to focus attention on whatever of leadership it has attained. The discriminating reader will treat such proof of commanding position as likewise indicating ability to meet a prospective problem.

Lurking in the mind of the average man is the realization that the leader in his line has progressed far beyond what we know of his achievements. And, while it develops the confidence that is essential in bringing about business relations,

publicity on these achievements still has the ample safeguard indicated in the familiar couplet:

They copied all they could follow, but they couldn't copy my mind,
And I left 'em sweating and stealing a year and a half behind.

More Boring from Within

The so-called unlawful strike of switchmen and other railroad employees vividly recalls the days of last fall when the heads of the American Federation of Labor permitted William Z. Foster, syndicalist and advocate of the worst forms of industrial warfare, to lead the steel strike, although he had openly declared that the policy of the radicals was to bore from within and thus undermine the old and relatively conservative labor unions. Foster and his associates had reason to believe that they could better accomplish their results by using the old organization than by attempting to set up new national unions.

The republication of the *Syndicalist* and the opportunity given Samuel Gompers and other leaders to repudiate the radicals afforded ample time for decisive action by the union leaders which would have put the radicals into permanent retirement. The opportunity, however, was not grasped and in the news dispatches this week the names of W. D. Haywood, William Z. Foster and others of that class are prominent. That their influence has been an important factor in bringing about the present railroad strike and the rebellion against the brotherhoods cannot be doubted. It is also agreed by officials of the big railroad unions that the I. W. W. is backing the radical agitators. These officials express the conviction that they will be able to prove this and thus bring the great majority of the workers back to work. That is a most difficult undertaking, but the country will, of course, hope that it will succeed. But at best there will be a narrow escape from complete disruption of the brotherhoods and the experience should convince union leaders of the folly of training with or tolerating the radical element as they chose to do in the case of the steel strike.

The delays in deliveries on new purchases and the difficulty of getting prompt and satisfactory repair work emphasize the desirability, particularly now, of maintaining that degree of cleanliness in a plant which tends to minimize breakdowns, spontaneous combustion, or other sources of trouble and danger. It is probable that the value for the factory of the portable vacuum cleaner is not appreciated. A reversed current through a vacuum cleaner designed of suitable proportions for factory work gives an air blast which can be utilized to blow out dust and dirt accumulations, particularly in places difficult of access. Cleanings of this kind from time to time prevent the accumulation of the dust in such quantities that with the ever-present oil it becomes more or less caked and then exceedingly difficult to remove. Fire insurance authorities find that fires are often caused directly or indirectly by dust accumulations. The factory electric motor is quite generally much neglected in this respect, and a burned-out motor winding, with repairs expensive and substitute machines difficult to get, may well be avoided by periodic use of the factory air cleaner, even should no other important use for such a machine seem obvious.

Man the Railroads from the Colleges

Why not rally the college student bodies, particularly those in the engineering schools, to help put down the rebellion of railroad workers? The situation cannot become much more acute before unprecedented means to right it will be spontaneously employed. The public is not going to stand threatened starvation, or even continued annoyance and unnecessary deprivation of work because of a fight for control within the labor organizations.

We have the lesson of England. There, in the railroad strike last fall people of all ranks and employment tackled with determination jobs which they soon learned to perform, and apparently a like outcome will be witnessed here. On the more difficult tasks of operating trains, students of engineering, with the quick adaptability belonging to their age, could help out after intensive instruction, and they could be counted on to rally with a will against the starvation attack on the community.

Let the national engineering societies, with their branch organizations in the engineering colleges, use the telegraph to prepare for the emergency.

American Electric Ferroalloys

Only a few years ago it would have been impossible for an American technical society to feature on its convention program a symposium on electrically made alloys, particularly ferroalloys, as made in the United States. But this was the distinguishing feature of the annual spring meeting at Boston last week of American electrochemists. Out of thirteen papers on the program nine were discussions of ferroalloys, or similar products made electrically in this country. All of the major ferroalloys used in the steel industry were represented by papers except ferrotungsten and ferromolybdenum.

Not only were the fundamental problems of alloy research and the recent developments in the ferroalloy industry treated by men who spoke with authority, but the individual alloys and their uses and production were discussed, many new features being brought out. The various types of electric furnaces suitable for alloy production were also considered and the rare ferroalloys as well as special alloys were not neglected. The number of such special alloys constantly being developed and made possible by the electric furnace was a revelation.

Such an occasion emphasizes in a new way the importance of the electric ferroalloy industry to metallurgical progress. Before the war most of these alloys, except ferromanganese, spiegeleisen and the lower grades of ferrosilicon, were imported. Even at that time fifty per cent of the ferromanganese consumed in this country was British. To-day producers of American alloy

steel secure at least a majority of their alloys from domestic makers. There are to-day about 25 producers of 14 major and minor ferroalloys in the United States, against a comparatively insignificant number before the war.

The future of this industry is bright. The demand for the established ferroalloys and for special metals containing alloys is expanding rapidly, all apart from armament uses. Production in the electric furnace is a commercial success; in fact, it is electricity that has made possible these striking developments in new alloys, and new uses for old alloys are constantly appearing. There is little danger of exaggerating the possibilities of the future, so striking have been the advances in time so very recent.

HIGH RATE OF INGOT OUTPUT

March Production Exceeded Only in October, 1917 and 1918

The American Iron and Steel Institute's statistics of steel ingot production in the United States for March show the largest total that has been reported since October, 1918. The 30 companies reporting to the Institute (companies which made about 84 per cent of the steel ingot production in 1918) had a total output in March of 3,296,799 gross tons. Counting 27 working days, this represents 122,104 tons per day. If the remaining 16 per cent produced at a corresponding rate, the total output for the country for March was 3,924,570 tons, or 145,350 tons per day. Counting 310 steel producing days in the year this daily average, if kept up for a year, would represent an output of 45,061,600 tons. The greatest twelve months' output of ingots was in 1917 when the total was 43,619,200 tons. For 1918 it was 43,051,022 tons. Thus the March output represents a yearly rate nearly 1,500,000 tons more than the production of the banner year, 1917. The figures below, from the monthly reports of the American Iron and Steel Institute, show the distribution as between Bessemer and open-hearth steel. Ingot statistics were not gathered in September, 1919, when the steel strike began, or in the three months following:

Monthly Production of Steel Ingots of Companies Producing 84.03 Per Cent of Total in 1918—Gross Tons

	Open Hearth	Bessemer	All Other	Total
January, 1919....	2,351,153	749,346	7,279	3,107,778
February	2,043,635	655,206	5,842	2,704,683
March	2,100,528	555,332	6,405	2,662,265
April	1,732,447	500,770	6,494	2,239,711
May	1,506,015	414,392	8,617	1,929,024
June	1,692,257	521,634	5,328	2,219,219
July	1,875,630	625,246	7,300	2,508,176
August	1,988,651	748,212	9,218	2,746,081
January, 1920....	2,241,318	714,657	10,687	2,996,662
February	2,152,106	700,151	12,867	2,865,124
March	2,484,995	795,164	16,640	3,296,799

In only two months has the March ingot production been exceeded—October, 1918, with 3,352,196 tons (for the 30 companies reporting), and October, 1917, with 3,351,935 tons.

Demand for Steel Products in Argentina

WASHINGTON, April 12.—Information relative to the present demand for iron and steel products in Argentina is given in a report just made to the Bureau of Foreign and Domestic Commerce by W. W. Ewing, trade commissioner. Mr. Ewing states that industrial expansion has ceased almost entirely in Argentina since the price of steel in the United States reached high levels during the war, and that there is a great scarcity of all sorts of iron and steel products at the present time.

Until the outbreak of the European war, Mr. Ewing says, Argentina was considered by all countries making iron and steel products as one of the most attractive foreign markets for their goods. The total production of these commodities has been greater than the total of any other class of goods except foodstuffs and cotton goods.

"The scarcity of commercial iron and steel products is accentuated monthly in Argentina," says Mr. Ewing. "It would be difficult to state definitely what class of steel products is most in demand at the present time. Plates and sheets, including tin plate, have for some time been entirely out of the market. The United States prohibited the exportation of these products on entering the war. The largest concern in Argentina foresaw the possibility of this shortage, and early in 1917 imported large quantities of plates, for which it obtained unprecedented prices; but its stock is now almost exhausted. Sheets are also very difficult to obtain, recent inquiries made for them, as well as for structural steel, being met with the statement that they could not be obtained in the United States."

To Finance Movement of Raw Material Into Germany

WASHINGTON, April 13.—The manner in which a new company formed at Hamburg proposes to finance the importation of raw material into Germany is described in a communication received by the State Department from Consul Frederick Simpich, who is on duty with American Commission at Berlin.

The new company is known as the Deutsche Waren-Treuhand-Aktiengesellschaft. This company has adopted the same general plan as followed by the Deutsche Industrie Treuhand Aktien Gesellschaft, whose organization was previously announced. The following bankers united to form the Hamburg company: M. M. Warburg & Co., Joh. Berenberg, Gossler & Co., Conrad Hinrich Donner, Munchmeyer & Co., Schroder Gebruder & Co., Vorwerk Gebr. & Co., all of Hamburg; A. Levy and Sal. Oppenheim, Jr., & Cie, of Cologne, and Mendelssohn & Co., of Berlin.

A general outline of the scope of this new company, as announced by Warburg & Co., of Hamburg, is as follows:

"The capital subscribed so far is 10,000,000 marks (mark = $0.238, at par of exchange). The shares, being taken over by the founders at 110 per cent of par, have been paid to the amount of 25 per cent, plus the premium.

"According to paragraph 2 of the by-laws, the object of the company is to make all transactions in connection with the securing of credits to German firms for the purchase of merchandise, particularly of raw materials, intended for re-export as manufactured goods. The company may also act as trustee to secure interests arising out of participations and credits. It is proposed to open a branch at Berlin."

Americans Honored

Awards of decorations to several well-known Americans for their work during the war by the Italian Government have been announced by the Italian High Commissioner, as follows:

Cross of the Grand Officer of the Crown of Italy, to Judge Elbert H. Gary, chairman United States Steel Corporation.

Cross of Knight Commander of the Crown of Italy, to James A. Farrell, president United States Steel Corporation; William H. Woodin, president American Car & Foundry Co.; Andrew Fletcher, president American Locomotive Co.

Cross of Officer of the Crown of Italy, to Charles S. Gawthrop, vice-president American Car & Foundry Co.; E. P. Thomas, president United States Steel Products Co.; F. Wilshire, vice-president Consolidation Coal Co.; Charles Muchnic, vice-president American Locomotive Co.

CORRESPONDENCE

Now Is the Time to Speak

To the Editor: Permit me to thank you for the reply which you made to Mr. Bolles's letter of March 8 on the metric system. There are thousands, I believe, who are opposed to the compulsory adoption of that system but who have taken no part in the discussion. The writer is connected with a plant which conducts a great deal of research, but there is not the slightest attempt to coerce the manufacturing department into the use of the metric system because it is found useful in the laboratory. The department heads are too far-seeing and of too broad experience to distort a business to fit a system.

The reference Mr. Bolles makes to England's inclination to use "metric money" shows the error so prevalent among metricists. They assume that "decimal" and "metric" are interchangeable.

H. D. MURPHY.

Medford Hillside, Mass., April 9, 1920.

Steel Corporation Will Not Discriminate Against American Vessels

WASHINGTON, April 13.—E. H. Gary has telegraphed Admiral W. S. Benson, chairman of the Shipping Board, assuring him that there is no intention on the part of subsidiaries of the United States Steel Corporation to discriminate against American vessels in export shipments from the Pacific Coast. Mr. Gary's telegram was prompted by messages sent by Admiral Benson to the United States Steel Products Co. and the Illinois Steel Co., asking if they were discriminating against American vessels. Admiral Benson's attention had been drawn to instructions said to have been issued by these companies to the effect that they would not make further shipments by lines which are required to put the value of ocean freight rates in the through bills of lading.

The new transportation act makes it mandatory upon all carriers issuing through bills of lading for export freight moving via American registered vessels to name in such bills of lading both the rail and water rate.

Mr. Gary's telegram to Admiral Benson was as follows:

"My attention has been called to your telegram to our subsidiaries, the United States Steel Products Co. and the Illinois Steel Co., asking if they are discriminating against American vessels in shipment from the Pacific Coast. I think our local officials have been laboring under a misapprehension. Please be assured we will not intentionally antagonize the statutory regulation and there will hereafter be no ground for complaint."

Opposed to Coal Commissioner

WASHINGTON, April 13.—Senator Frelinghuysen's bill for the appointment of a coal commissioner has not met with favor at the hands of some coal operators. George H. Cushing, managing director of the American Wholesale Coal Association, says that the coal commissioner would turn out to be a joke, and that the only effect would be the stabilization of coal prices on a higher level.

To prove his point, Mr. Cushing refers to the market information collected by the Department of Agriculture. Mr. Cushing advances the contention that the gathering of this data as to the demand and the prices of different food commodities tends toward a stabilization of prices upon a higher than normal level.

Foundry and machine shop products of Canada were valued at $82,493,897 for the calendar year 1918, according to the report of the Dominion Bureau of Statistics that has just been issued. The total cost of raw materials was $27,788,059 and the aggregate of salaries and wages was $28,986,305, and total capital invested was $84,122,446.

CONTENTS

Making Seamless Brass Tubes....1087-1092
Many Furnaces Banked in Youngstown District....1093
Cast-Iron Planer Bed Electrically Welded....1094
Metal Trades Meeting Next Week....1094
British and French War Effort in Steel....1095-1097
Gang Slitting and Leveling Machines....1098
Profitable Uses for Foreign Money....1099-1100
Fuel Oil Prices as Reported from Chicago....1101
Steel Treaters' Annual Convention and Exhibition to Be Held in Philadelphia....1101
Non-Ferrous Casting Section of American Foundrymen's Association....1101
Manufacture of Electric Ferroalloys....1102
Precision Bench Lathe....1104
Engineers to Discuss Safety....1104
Ball Bearing Truing Machine....1104
American Electrochemical Society Meeting in Boston 1105-1109
Europe Buys Foundry Iron....1109
Germany's Hampered Industry....1109
New Drop Forging Plant of Stroms Company....1110-1111
Conference Called on United States Shipping Policy....1111
Referendum on Proposed Federal Department of Public Works....1111
Editorials: Facing Facts as to Production—Conservatism Overdone—More Boring from Within—Man the Railroads from the Colleges—American Electric Ferroalloys....1112-1114
High Rate of Ingot Output in the United States in March....1114
Demand for Steel Products in Argentina....1114
To Finance Movement of Raw Material Into Germany....1114
Correspondence: Now Is the Time to Speak—Steel Corporation Will Not Discriminate Against American Vessels....1115
Colorado Fuel & Iron Co. Wins Important Victory Before Commerce Commission....1116
Link-Belt Co. Expansion....1116
Will Erect Pulverized Coal Plant....1116
Steel Strike Committee Makes Its Report....1117
Iron and Steel Markets....1118-1132
Decreased Immigration—Less Production....1133-1134
A Good Sign for the Shop to Increase Available Freight Cars....1134
Westinghouse Opens Employers' Cafe....1134
Report on Employee Representation....1134
Considering Industrial Legislation....1135
Labor Notes....1135
Non-Ferrous Metals....1136
Prices Finished Iron and Steel f.o.b. Pittsburgh....1137-1139
Personal....1140
Scandinavian Engineering Fellowships Awarded....1141
Obituary....1141
American Can Co. to Auction War Plants....1141
Short Trade Items....1142
Machinery Markets and News of the Works....1143-1153
Office Changes....1153
New Trade Publications....1153
Current Metal Prices....1154

Acquired by Savage Arms Co.

Confirmation is made of the sale April 1, of the J. Stevens Arms & Tool Co., Chicopee Falls, Mass., to the Savage Arms Co., Utica, N. Y. The New England Westinghouse Co. was the seller, it having acquired the property in 1914. The Stevens plant consists of two large four-story brick buildings, which are well and modernly equipped and have given employment to 700 to 1000 persons.

The Savage Arms Co. originally was organized in 1888 for the manufacture of high-power repeating rifles, revolvers, rapid-fire guns and cartridges. In December, 1915, it was acquired by the Driggs-Seabury Ordnance Co., a Delaware corporation, organized in August of that year. It has plants at Utica, Sharon and Philadelphia, has an outstanding capital of slightly less than $8,000,000, and has no bonded indebtedness. It has the exclusive right to manufacture in the Western Hemisphere the Lewis machine guns.

MUST REDUCE RATES

Colorado Fuel & Iron Co. Wins Important Victory Before Commerce Commission

WASHINGTON, April 12.—The Colorado Fuel & Iron Co. has won an important victory at the hands of the Interstate Commerce Commission against the Santa Fe, Burlington, Rock Island, St. Paul, Northern Pacific, Great Northern, Union Pacific, Southern Pacific and other railroads operating between Chicago and the Pacific Coast.

The commission has ordered those roads to reduce their rates from the Colorado Fuel & Iron Co.'s plant near Minnequa, Col., to Pacific Coast points so that they shall not exceed 77 per cent of the rates on iron and steel from Chicago to those points.

The company complained that although the average distance from Minnequa to those points is 65 per cent of the average distance from Chicago, the Minnequa rate has been maintained at 83.5 per cent of the Chicago rate. This the steel company charged to be unduly prejudicial and unduly preferential in favor of its competitors in Chicago and in the East. It therefore asked the commission to establish a rate from Minnequa to Seattle, Wash.; Portland, Ore.; San Francisco, and Los Angeles, not exceeding 75 per cent of the Chicago rate.

Link-Belt Co. Expansion

The Link-Belt Co., whose general offices are in Chicago, is carrying out an extensive program of expansion at its works in Chicago, Philadelphia, Indianapolis, Seattle, and Toronto. New manufacturing facilities have been added to the several plants, and the personnel of both factories and sales offices has been increased. Two new furnaces, the seventh and eighth, have been added to the chain works at Indianapolis in the last few months. Announcement of the purchase by the Link-Belt Co. of the Fairmount Foundry, at Philadelphia, was made a few days ago by Charles Piez, president of the Link-Belt Co. This deal involved several hundred thousand dollars. The foundry will be used as an adjunct to the eastern works at Philadelphia, supplying this plant with gray iron castings.

A new administration building is under construction at the Philadelphia works, and plans are being made to erect another such building at the Chicago works, to make room for enlarged engineering, sales, drafting, and clerical staffs.

The shops at Toronto and Seattle are being expanded to take care of the steadily growing business in those regions. In the Chicago works foundry, a conveying system is being installed to speed up the output. A new warehouse is under construction at Seattle. The Toronto shops and offices will shortly occupy new quarters there.

A. C. Johnston, formerly chief engineer of the Chicago works, has been elected a vice president of the Link-Belt Co., and resident general manager of the Chicago plant. He succeeded Prentiss L. Coonley, who resigned to devote his time to the presidency of the Isko Mfg. Co.

Will Erect Pulverized Coal Plant

The Pittsburgh Forge & Iron Co., Pittsburgh, has contracted with the Fuller Engineering Co., Allentown, Pa., for the erection of a pulverized coal plant to serve the puddling furnaces at the Alleghany plant. The coal pulverizing machinery will consist of two 42-in. Fuller mills, one indirect pulverized coal fired Fuller drier and the necessary connecting units. The coal plant building will be designed to eliminate any damage to the machinery as the result of high water.

One of the novel features of the installation will be the use of the Fuller-Kinyon pulverized material pumping system, which will deliver pulverized coal from the bins in the pulverizing plant to the bins located at the furnaces continuously or intermittently as desired. Under operating condition the coal dust flows at low velocity and acts similar to a liquid being pumped under low pressure.

The 36 furnaces which are being fired with coal by hand at the present time will be equipped for pulverized coal and changed over to this method without interfering with production. Standard Fuller coal feeders and burners will be used in which a mixture of coal dust and air will be delivered to the burner, at which point the necessary combustion air will be added, making each furnace a complete independent unit.

Victor R. Browning & Co. Taken Over

Negotiations have just been completed whereby the Sommer-Adams Co., Cleveland, acquired the assets and assumed the debt of Victor R. Browning, doing business as Victor R. Browning & Co., Cleveland, such assets to be paid for in stock of a new company. Negotiations have also been completed whereby the new company, The Browning-Sommer-Adams Co. will receive payment of stock exceeding $100,000 not later than the next 60 to 90 days. In addition to this a contract has just been signed with the Preferred Securities Co., whereby the company will start as soon as permitted by the securities department, selling $623,000 preferred stock of the re-organized company, which amount will provide for working capital, expansion and payment of all indebtedness except part of the borrowed capital which is being deferred over a period of four years.

By the terms of the merger, from $300,000 to $500,000 of additional assets are put behind the obligations of Victor R. Browning & Co. The new company will discontinue the general engineering business of Victor R. Browning & Co. and devote its entire capacity to producing steam shovels, locomotive cranes and electric hoists. The demand, from all indications, will far exceed the output, owing to great activity in road building.

Sandusky Company Purchased

The Sandusky Foundry & Machine Co., Sandusky, Ohio, a new corporation having 6000 shares, no par stock, has purchased all of the stock and assets of the Sandusky Foundry & Machine Co. formerly capitalized at $100,000 common and $100,000 preferred stock. The officers of the new corporation are W. H. Millspaugh, president; Wm. C. Boyle, Cleveland, O., vice-president; L. A. Stroh, treasurer. A permanent secretary has not been elected. The business was originally organized by W. H. Millspaugh in 1904. The company manufactures special patented paper mill machinery and fluid compressed bronze castings by the Millspaugh patented processes. It has furnished a large amount of its material to the Navy and War Departments, to the Emergency Fleet Corporation and has a large and increasing business in the paper industry. There have been few changes in the operating personnel of the company and the business will be continued as in the past. No immediate extensions or enlargements of the company's lines of manufacture are contemplated. The Sandusky Foundry & Machine Co. owns a large interest in the Fluid Compressed Steel Co., Keokuk, Iowa, which company is just beginning the manufacture of high-grade electric steel, using the Millspaugh process for casting the steel into suitable forms for lathe spindles, heavy and light wall tubes, etc. It is expected that considerable raw material will be shipped from Keokuk to Sandusky for finishing, as the Sandusky plant is particularly well fitted for turning and deep boring.

New Iron Ore Deposits Discovered

New iron ore deposits, estimated by geologists to contain more than 71,000,000 tons, are said to have been discovered near Waukon in Allamakee County, Iowa. The ore land has been bought by a St. Louis company and it is understood that the deposits will be tapped this summer. One iron mine is already in operation in Allamakee County and yields about 500 tons a day.

Steel Strike Committee Makes Its Report

Recruits Far Below the Claims Made Last Fall —Large Numbers Have Dropped Their Union Affiliations—Attempt to Re-enlist Deserters

AN echo of the labor upheaval in the iron and steel industry last fall is found in the general report on the strike issued from the offices of the secretary-treasurer of the National Committee of the American Federation of Labor for organizing iron and steel workers, 303 Magee Bldg., Pittsburgh.

In this report the committee claims that 156,702 members were recruited by the 24 International unions represented on the National committee, but contends that "well over 250,000 actual steel workers joined the unions during the campaign."

A detailed report is given, showing the acquisitions for each of the International unions from the various districts. According to this detailed statement the city of Youngstown, Ohio, led in recruits, with 19,040, while Cleveland was second with 17,305.

The document contains this addendum: "This detailed report includes only those members actually signed up by the National Committee for Organizing Iron and Steel Workers and from whose initiation fees $1.00 each was deducted and forwarded to the general office of the National committee. It represents approximately 50 per cent. to 60 per cent. of the total number of steel workers organized during the campaign and is a minimum report in every respect.

"The report does not include any of the many thousands of men signed up at Bethlehem, Steelton, Reading, Apollo, New Kensington, Leechburg and many minor points which felt the force of the drive but where the National committee made no deductions upon initiation fees. In Gary, Joliet, Indiana Harbor, South Chicago, and other Chicago District points, the National committee ceased collecting on initiation fees early in 1919, hence this report makes no showing of the thousands of men signed up in that territory during the last few months of the campaign before the strike. Likewise at Coatesville and Sparrows Point, during only a short space of the campaign, were deductions made for the National committee. Many thousands more men were signed up directly by the multitude of local unions in the steel industry, that were not reported to the National committee. These do not show in this calculation. Nor do the great number of ex-soldiers who were taken into the union free of initiation fees—in Johnstown alone 1300 ex-soldier steel workers joined the unions under this arrangement. Of course no accounting is here included for the army of workers in outside industries who became organized as a result of the tremendous impulse given by the steel campaign."

The statement is signed by William Z. Foster, as secretary-treasurer of the National committee, and by Enoch Martin, auditor District 12, United Mine Workers of America.

General report on the "steel strike relief fund" has also been issued from the same office, certified by the finance committee. Recapitulation shows a total of $418,141.14 collected by the American Federation of Labor and forwarded to the National committee. The statement covers the period from Nov. 4, 1919, to Jan. 30, 1920, and includes moneys turned over by Frank Morrison, secretary of the American Federation of Labor, to John Fitzpatrick, chairman of the National committee. The statement does not disclose the amounts collected in the various districts or the source of the funds.

During the strike the committee expended $348,509.72 for the following—meat and groceries, $178,695.64; commissary checks for points outside Pittsburgh district, $93,082.82; labor and expenses, $3,612.44; freight and drayage, $3,757.24; bread, $46,739.54, and potatoes, $22,622.04. Presumably these supplies were distributed at the commissaries opened in the various strike districts. The balance of $69,631.42, the report states, has been deposited to the credit of the National committee.

During the organization campaign special efforts were made by organizers to unionize common laborers in the steel plants, but the report affords no enlightenment as to the number of such acquisitions. They are probably included, however, in the totals for "iron, steel and tin workers" and "iron workers."

It will be recalled that the actual number of acquisitions, placed at 156,702, is much below the flamboyant figures announced to the press during and preceding the strike by members of the National committee, such estimates ranging as high as 350,000.

Since the strike, which terminated so disastrously for the organizers, large numbers of the recruits have dropped their union affiliation, particularly the foreign-born workers, and efforts are now being directed in some centers to re-enlist these deserters from the ranks.

Shortage of Foreign Unskilled Labor

To plan for the elimination of the shortage of 4,000,000 workmen in the basic industries of the United States and the probable additional shortage when about 1,000,000 more immigrant workmen return home as soon as passport and food conditions permit, the Inter-Racial Council, 120 Broadway, New York, held a national conference on immigration at the Engineering Societies Building, 29 West Thirty-ninth Street, New York, on April 7. There were about 750 delegates, including representatives of 30 racial groups, together with national leaders in industry, finance, agriculture, labor and education. About 30 iron, steel and metal-working industries were represented.

The conference formulated a resolution to aid Congress in passing bills providing for better assimilation, admission, stabilization and naturalization of immigrants. It was emphasized that there are over 100 bills pending in Washington, which, if passed, will not only shut out the future supply of workmen but will prevent many from returning to this country who will go back to attend to their affairs.

The resolution would provide for the creation of a Federal Board of Assimilation, for the compulsion of immigrants of school age to learn the English language, for a Federal grant to the States for immigrant education, for the repeal of the literacy test for entrance to the United States, for the increase in the number of officials enforcing the immigration laws, for the throwing open to the public of hearings with respect to the admission or deportation of immigrants, for the establishing of consular agents in the countries whence immigration may be expected and for the establishing of more banking laws to protect the savings of immigrants.

In the evening the conference attended the Capitol Theater, New York, where were shown slides pertaining to the situation of the foreign born in the United States.

William H. Barr, president National Founders' Association, is president of the Inter-Racial Council. Among the speakers was J. E. Otterson, president Winchester Repeating Arms Co., New Haven, Conn., whose address covered immigration and production.

The Interstate Iron & Steel Co. has opened a restaurant for its employees in the basement of its office building at East Chicago.

Iron and Steel Markets

RAILROAD PARALYSIS

Widespread Shutdowns of Blast Furnaces and Steel Plants

Industry May Be Brought Almost to a Standstill, But a Long Tie-up Not Expected

Nearly half the steel industry is at a standstill because of the railroad strike, and if the tie-up lasts for another two days the shutdown of steel works and rolling mills will be nearly complete. And this happens just as car and fuel difficulties were being overcome and production was getting into a new record stride.

Recitals of the precise situation in leading districts and at particular plants of the large producing companies show no material variations. Many plants are still going because raw materials are on hand; but few are able to ship finished product, and the backing up of the stream thus becomes simply a question of time.

At Pittsburgh the refusal of Pennsylvania Railroad employees in the Pitcairn yard to go out may mark the turn in the situation, and, if so, another two days may entirely change the face of things. Expectation in the trade is that there will be a straggling resumption of traffic, just as the shutdowns came in one section while work was still on in full elsewhere.

The Chicago district was hardest hit by the beginning of the strike, and on Monday only 10 of the Illinois Steel Co.'s 23 blast furnaces were at work. In and around Youngstown 20 out of 25 blast furnaces were banked. The shutdown was almost complete at Buffalo on Tuesday. At Cleveland less than half the blast furnaces were banked but no freight was moving in or out. Pittsburgh reported a 50 per cent operation, which was expected to be down to 25 per cent by Wednesday or Thursday unless the strike collapsed.

There is no way of measuring the new setback to deliveries of steel, but as consumption and production are both blocked by the paralysis of transportation, the scarcity of steel may not be greatly accentuated. However, the wholesale banking of furnaces means much off-grade iron on resuming and irregular steel quality will also be a consequence.

Though all other factors are overshadowed by the strike, record must be made of the high rate of steel ingot production in March. At more than 145,000 tons a day, it represents upwards of 45,000,000 tons per year, whereas the greatest year, 1917, showed 43,619,000 tons. In only two months—October, 1917 and 1918—was the March ingot production exceeded.

Few more round tonnages of rails remain to be bought for 1920. Additional rail capacity is available at Bethlehem Steel Co. plants, but against this when put into operation is considerable unsatisfied export demand. For 1921 delivery a Southwestern railroad is inquiring for 25,000 tons. At the $57 price upward of 100,000 tons has been bought by American roads.

New car inquiries cover about 7000, including 500 for the Bethlehem Steel Corporation. The B. & O. will buy 5000 to 10,000 tons of plates, shapes and bars for car repairs.

About 25,000 tons of structural work in large-sized projects has been closed, including 6700 tons for the American Telephone & Telegraph Co. in New York, 3500 tons for an office building for the Barrett Co. in New York and 4100 tons for the Kansas City Federal Reserve Bank. About 40,000 tons is active, including 13,000 tons for the Cincinnati Southern bridge at Cincinnati.

The New York Shipbuilding Corporation is inquiring for 8000 to 16,000 tons of plates for tankers, delivery in the last four months of the year. In the Middle West new inquiry has come up for 15,000 to 20,000 tons of ship and tank plates.

The steel jobbing trade, except the warehouse department of the Steel Corporation, is now asking $25 to $35 per ton over mill prices on the major rolled products, as against $15 formerly.

The attitude of the automobile trade is indicated by a contract which a forging maker is seeking to place for 2000 tons of steel per month over two years. An automobile manufacturer agrees to pay the forging company any increase in the steel price above, say, 2.90c. per lb., and any increase in the labor item over the figure in the contract.

Blast furnaces which have been able to operate are piling the iron as it is made, for shipments are impossible. Pig iron buying has been curtailed this week, after a week of fair activity, but optimistic sentiment prevails and prices are strong, with a tendency upward in some centers, especially eastern Pennsylvania. In Virginia irons some makers have advanced $1. In the South, while $38 is still the price of the leading steel company on a limited tonnage, most of the iron sold is at $40 and $42.

The upward movement in prices in Great Britain has not yet stopped. Wages of tin plate workers which were increased 40 per cent in January have now been put at 50 per cent above the rate of 1919 for the three months beginning April 3.

The German Government has prohibited all exports of steel according to our cable from London.

Pittsburgh

PITTSBURGH, April 13.

A complete stoppage of all shipments of iron and steel products; in fact, a complete tie-up of the local railroads as a result of the switchmen's strike, is a new blow that has come to the steel trade since Sunday. The railroad strike, which originally started in the New York and Chicago districts, reaching the Pittsburgh district last Sunday, is the most complete that has taken place in many years. Many iron and steel plants in the Pittsburgh district are down tight, some

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Apr. 13, 1920	Apr. 6, 1920	Mar. 16, 1920	Apr. 15, 1919
No. 2 X, Philadelphia‡	$47.05	$47.05	$45.35	$31.90
No. 2, Valley furnace†	43.00	43.00	41.00	26.75
No. 2 Southern, Cin'ti†	43.60	43.60	43.60	30.35
No. 2, Birmingham, Ala.†	40.00	40.00	40.00	26.75
No. 2, furnace, Chicago*	43.00	43.00	43.00	26.75
Basic, del'd, eastern Pa.	44.80	44.80	44.80	29.65
Basic, Valley furnace	42.00	42.00	41.50	25.75
Bessemer, Pittsburgh	43.40	43.40	43.40	29.35
Malleable, Chicago*	43.50	43.50	43.00	27.25
Malleable, Valley	43.00	43.00	42.00	27.25
Gray forge, Pittsburgh	42.40	42.40	42.40	27.15
L. S. charcoal, Chicago	57.50	56.50	57.50	38.85

Rails, Billets, etc., Per Gross Ton:				
Bess. rails, heavy, at mill	$55.00	$55.00	$45.00	$45.00
O.-h. rails, heavy, at mill	57.00	57.00	47.00	47.00
Bess. billets, Pittsburgh	60.00	60.00	60.00	38.50
O.-h. billets, Pittsburgh	60.00	60.00	60.00	38.50
O.-h. sheet bars, P'gh.	80.00	80.00	65.00	42.00
Forging billets, base, P'gh.	80.00	80.00	80.00	51.00
O.-h. billets, Philadelphia	64.10	64.10	64.10	42.50
Wire rods, Pittsburgh	70.00	70.00	70.00	52.00

Finished Iron and Steel Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	4.25	4.25	4.25	2.595
Iron bars, Pittsburgh	4.25	4.25	4.25	2.35
Iron bars, Chicago	3.75	3.75	3.50	2.50
Steel bars, Pittsburgh	3.75	3.75	3.75	2.35
Steel bars, New York	4.02	4.02	4.02	2.62
Tank plates, Pittsburgh	3.75	3.75	3.75	2.65
Tank plates, New York	4.02	4.02	4.02	2.92
Beams, etc., Pittsburgh	3.25	3.25	3.25	2.45
Beams, etc., New York	3.52	3.52	3.52	2.72
Skelp, grooved steel, P'gh.	2.75	2.75	2.75	2.45
Skelp, sheared steel, P'gh.	3.00	3.00	3.00	2.65
Steel hoops, Pittsburgh	4.00	4.00	4.00	3.05

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.
†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

Sheets, Nails and Wires, Per Lb. to Large Buyers:	Apr. 13, 1920 Cents	Apr. 6, 1920 Cents	Mar. 16, 1920 Cents	Apr. 15, 1919 Cents
Sheets, black, No. 28, P'gh.	5.50	5.50	5.50	4.35
Sheets, galv., No. 28, P'gh.	7.00	7.00	7.00	5.70
Sheets, blue an'l'd, 9 & 10.	4.50	4.50	4.50	3.55
Wire nails, Pittsburgh	4.00	4.00	4.00	3.25
Plain wire, Pittsburgh	3.50	3.50	3.50	3.00
Barbed wire, galv., P'gh.	4.45	4.45	4.45	4.10
Tin plate, 100-lb. box, P'gh.	$7.00	$7.00	$7.00	$7.00

Old Material, Per Gross Ton:				
Carwheels, Chicago	$37.00	$37.00	$35.00	$21.00
Carwheels, Philadelphia	40.00	40.00	42.50	23.00
Heavy steel scrap, P'gh.	*25.50*	27.00	27.50	15.00
Heavy steel scrap, Phila.	*24.00*	24.50	25.00	15.50
Heavy steel scrap, Ch'go.	23.50	23.50	24.00	16.50
No. 1 cast, Pittsburgh	*33.00*	34.00	34.00	18.00
No. 1 cast, Philadelphia	38.00	38.00	40.00	22.00
No. 1 cast, Ch'go (net ton)	37.00	37.00	37.50	21.50
No. 1 RR. wrot., Phila.	35.00	35.00	36.50	22.00
No. 1 RR. wrot., Ch'go (net)	27.00	27.00	26.75	16.00

Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt	$10.00	$10.00	$6.00	$3.50
Furnace coke, future	10.00	10.00	6.00	4.00
Foundry coke, prompt	11.00	11.00	7.00	4.00
Foundry coke, future	11.00	11.00	7.00	4.50

Metals, Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	19.50	19.50	18.37½	15.50
Electrolytic copper, N. Y.	19.25	19.25	18.25	15.25
Spelter, St. Louis	*8.40*	8.60	8.50	6.15
Spelter, New York	*8.75*	8.95	8.85	6.50
Lead, St. Louis	**9.00**	8.75	9.00	4.75
Lead, New York	**9.25**	9.00	9.37½	4.95
Tin, New York	63.25	63.25	62.25	72.52
Antimony (Asiatic), N. Y.	*11.00*	11.37½	11.00	6.62½

The above prices are for domestic delivery and do not necessarily apply to export business.

are operating about 25 to 50 per cent, but unless the strike is settled within 48 hours there will be a complete suspension of work in the Pittsburgh and nearby districts. Absolutely no freight is moving in or out of the mills, and operations cannot last more than a few hours longer on present supply of fuel. The supply of foodstuffs in Pittsburgh is fairly good, but profiteering has started, and unheard-of prices are being asked by profiteers for the necessaries of life.

At noon on Tuesday yard men employed in the Pitcairn yards of the Pennsylvania Railroad voted almost unanimously to remain at work, and they strongly repudiated the action of the outlaw class of workers who participated in this great railroad strike, which is a national calamity. Reports received here indicate the men are returning to work in Western cities, and it is believed that the action of the Pennsylvania yardmen in remaining at work will quickly induce the strikers to also return to their jobs. The Pittsburgh & Lake Erie Railroad is tied up tight on freight and passenger service, and at this writing is not moving a wheel. The passenger trainmen on the Pennsylvania Railroad East, and on the Pennsylvania Lines West are still at work, but there is much delay in passenger service and some trains have been annulled. The Pennsylvania Railroad is selling all passenger tickets east and west subject to delay, but through trains on the Baltimore & Ohio are running nearly on schedule time. The appointment of the Railroad Labor Board of nine by President Wilson, to settle the disputes between the railroads and their striking employees, will, it is hoped, have the effect of bringing an early termination of the strike; in fact, it may be practically settled as far as the men returning to work is concerned before this board has had time to take action.

The tie-up of the railroads means another large decrease in production of iron and steel, also great delay in shipments, and it will take some weeks to straighten matters out, even if the strikers return to work in a day or two. Manufacturing plants are loading cars with material they are making, but they are not being moved, and this can last only a short time, as the yards of the mills will soon be congested.

Present output of steel in the Pittsburgh district is not over 50 per cent of normal, and it will be down to 25 or less by Wednesday or Thursday unless the strikers return to work within the next 24 hours. The strike has not the sympathy of the public, was ill-advised, and will react on the men responsible for it.

There has been almost a complete suspension of efforts to do business on Monday and Tuesday, many steel concerns having sent wire instructions to their salesmen to make no commitments until the railroad trouble is settled. Blast furnaces are on the ragged edge and some in the Pittsburgh district and nearby places will have to bank in a few hours, if coal and coke are not received.

Pig Iron.—The market has been neglected on account of the railroad strike, and there has been practically a complete absence of any sales of iron since our report last week. The Union Steel Casting Co. is credited with having bought 1000 tons of Bessemer for third quarter at $42 at a nearby furnace, which has a freight rate of $1.10 to point of delivery. There have also been some small sales of foundry iron at $43, Valley furnaces, but general inquiry is light. Prices are ruling very firm, due partly to the higher prices for coke, many furnaces having to buy some coke in the open market at $10 to $11 per gross ton, on account of delayed shipments on contracts. At this writing

reports are that six or eight blast furnaces in the Pittsburgh district banked about 5 o'clock on Tuesday, on account of the railroad strike, while others are on short blast in order to save coal and coke. In the Youngstown, Sharon, Newcastle and Wheeling districts many blast furnaces are banked because of the strike.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh districts being $1.40 per gross ton.

Basic	$42.00 to $43.00
Bessemer	42.00
Gray forge	41.00 to 42.00
No. 2 foundry	43.00
No. 3 foundry	42.50
Malleable, Valley	43.00 to 43.50

Billets and Sheet Bars.—Increased production of billets and sheet bars was coming along nicely until the railroad strike started but is now down to less than 50 per cent in the Pittsburgh district, and there has been practically suspension of operations in the steel plants in the two Valleys. Thousands of tons of billets and sheet bars are loaded on the cars at the steel mills, but they cannot be moved, as the strikers refuse to touch them.

We now quote 4 x 4-in. soft Bessemer and open-hearth billets at $38 to $60; 2 x 2-in. billets, $42; Bessemer sheet bars, $42 to $70; open-hearth sheet bars, $42 to $80; and forging billets, ordinary carbons, $80 to $85 base, all f.o.b. Youngstown or Pittsburgh mill.

Ferroalloys.—Many steel plants were short in supply of ferromanganese before the railroad strike started, and as no material has moved for several days, the situation is now desperate. Almost any prices would be paid for delivery of ferromanganese which the mills need so badly. In the past week there were sales of four or five cars of spot domestic ferromanganese at $250 per gross ton or higher, delivered. Prices are very strong, and owing to the acute shortage in supply, are likely to be higher.

We quote 76 to 80 per cent domestic ferromanganese $200 for last half delivery and $250 for prompt delivery, with a reduction of $1.50 to $1.75 per unit for lower percentages. We quote 50 per cent ferrosilicon at $85 to $90, and 18 to 22 per cent spiegeleisen at $55 to $57.50, delivered. Prices on Bessemer ferrosilicon are: 9 per cent, $56.50; 10 per cent, $59.50; 11 per cent, $62.50; 12 per cent, $66.10. We quote 6 per cent silvery iron, $45.75 to $46.25; 7 per cent, $50 to $50.50; 8 per cent, $52 to $52.50; 9 per cent, $54 to $54.50, and 10 per cent, $56.50 to $57. An advance of $3.30 per gross ton is charged for each 1 per cent silicon for 11 per cent and over on Bessemer ferrosilicon, and an advance of $2.50 per gross ton is charged for each 1 per cent silicon for 11 per cent and over on silvery iron. All the above prices are f.o.b. maker's furnace, Jackson or New Straitsville, Ohio, which has a uniform freight rate of $2.90 per gross ton for delivery in the Pittsburgh district.

Plates.—The Southern Pacific is in the market for 2000 box cars, 1000 flat cars, 1000 stock cars, and 65 cabooses. Local steel car companies are now figuring on this inquiry. Plate mills in this district are down to 25 to 50 per cent of production, while some mills in the Wheeling and Youngstown districts are down tight.

We quote sheared plates of tank quality, ¼ in. and heavier, at 2.65c. to 3c. for very indefinite delivery, while prices on ¼-in. and heavier plates, named by mills that will agree to ship out in three to four months, range from 3.50c. to 4c. at mill.

Structural Material.—Inquiry is reported by local fabricators to be active, but the amount of new work being placed is not very heavy. The American Bridge Co. has taken 1000 tons for an addition to an automobile plant at Detroit and the McClintic-Marshall Co. 500 tons for shop buildings for Akron, Ohio. The Carnegie Steel Co. continues to quote 2.45c. on plain material up to 15 in., while other mills quote from 2.90c. to 3.50c., or higher.

Sheets.—The allotment of sheets made by the American Sheet & Tin Plate Co. to its sales managers last week has been pretty well disposed of and this company is now practically booked full on sheets of all grades up to the end of the year. Some independent sheet mills are quoting lower prices for last half delivery than they have been quoting recently for second quarter. Many sheet mills are closed down on account of the railroad strike, and others will go down in a few hours, as they have practically worked up all the sheet bars on hand.

We quote No. 28 gage box annealed, one-pass black sheets at 4.35c. to 6.50c.; No. 28 galvanized, 5.70c. to 8.50c., and Nos. 9 and 10 blue annealed at 3.55c. to 6c., the lower prices named being the March 21 schedules, which are still named by the leading interest, while the higher prices represent a fair range of quotations by the independent mills.

Tin Plate.—Last week a meeting of sales managers of the American Sheet & Tin Plate Co. was held here, at which this company allotted a certain tonnage of tin plate for last half of the year among its sales managers, nearly all of which has been sold. This concern is having very heavy inquiry for tin plate for export, which it is compelled to turn down, desiring to take care of its domestic customers as fully as possible. Some independent tin plate mills have not yet decided on a selling policy for last half delivery, deciding to hold off for a time before making commitments at the $7 per base box price. However, three or four large independent mills have sold heavily for last half of the year at the price named by the leading interest. Output of tin plate to-day is down to about 25 per cent of normal because of the railroad strike, and it was expected that many plants would have to close down tight on Tuesday night.

We now quote tin plate to domestic consumers for remainder of the year delivery at $7 per base box, stock items $8.50 to $9, and for export $11 to $12 per base box, all f.o.b. Pittsburgh.

Wire Rods.—The inquiry for wire rods is very active, but local mills are turning this down, as they have practically no rods to spare for the open market. Tenders of business in soft rods to the mills at prices considerably above $70 are frequent. We quote soft Bessemer and open hearth rods at $70 to $75, and high carbon rods $80 to $100 at mill.

We quote wire nails at $3.25 base, this being the price of the American Steel & Wire Co., and $4 base on the new card recently issued by four or five of the independent mills. We quote bright basic wire at $3, this being the price of the American Steel & Wire Co., and $3.50, this being the price of most of the independent mills.

Wire Products.—None of the local independent mills is taking on any new business until the railroad strike is settled, but say when they have any wire nails or wire to spare to regular customers their price will be $4 base for wire nails on the new card, and $3.50 for manufacturers' wire, usual extras. One independent mill has sold wire nails at $4.50 in a small way, and will not accept any orders except from regular customers and at $4.50 base per keg.

Cold-Rolled Steel Bars.—Local makers are practically out of the market, and are taking on but very little business. One leading maker is quoting $4.25 base. It is said that 65 to 75 per cent of the new business being placed by regular customers is being accepted by the makers at $4.10 to $4.25 base per 100 lb., but a few makers are accepting premiums in prices running up to 6c. and 7c. per lb. We quote cold-rolled steel bars at $4.10 to $4.25 per 100 lb. to regular customers, and from 5c. to 6c. per lb. for small lots for fairly prompt shipment.

Iron and Steel Bars.—The railroad strike will cause a very large loss in production of both iron and steel bars and will put the mills farther back in deliveries. Specifications against contracts are heavy and the mills rolling iron or steel bars are sold up for months ahead.

We quote steel bars rolled from billets at 2.35c., this being the price of the Carnegie Steel Co. for very indefinite delivery, likely not before first quarter of next year. Other mills rolling steel bars from billets quote from 3c. to 4c. at mill, prices depending entirely on the buyer and the delivery wanted. The demand for concrete reinforcing steel bars is fairly active, and we quote these, when rolled from billets at 4c. to 4.25c., and from old steel rails at about 3.50c. at mill. We quote common iron bars at 4.25c. to 4.50c., and refined iron bars, 4.50c. to 5c. in carloads, f.o.b. mill, Pittsburgh.

Strip Steel.—Makers of both hot- and cold-rolled strip steel are sold up over second quarter, but some are accepting business for third quarter delivery at prices in effect at the time delivery is made. We quote hot-rolled strips at 7c. to 10c. per lb. at mill, prices depending entirely on whether the buyer is a regular customer, the quantity involved and the delivery.

Spikes.—Some time ago the Baltimore & Ohio placed 12,000 kegs of standard spikes, and recently placed an additional order with a local maker. One interest reports it has orders on its books for more than 100,000 kegs of spikes, and has none to sell for delivery before August. No large inquiries for standard spikes have come out from the railroads recently.

We quote standard spikes, ½ to 9/16 in. and larger, $4 base per 100 lb. in carload lots of 200 kegs of 200 lb. each, and small spikes, ⅝ in. and 7/16 in., $4.50; 5/16 in., $5; boat and barge spikes, $4.25, f.o.b. Pittsburgh. Tie plates, $3 to $4 per 100 lb.

Iron and Steel Pipe.—Demand is still abnormally heavy, and mills are steadily turning away three or four times as much offered business as they are accepting. All the mills making iron or steel pipe are practically sold for the remainder of this year, and are accepting new business only from regular customers, when practically compelled to do so, and for indefinite delivery. Discounts on iron and steel pipe are given on page 1137.

Coke.—The coke trade has been badly upset by the railroad strike, many concerns piling their hand-drawn coke in their yards and shutting down plants where ovens are machine drawn, having loaded all the cars they have on hand, and which are not being moved. Several large inquiries came in the market last week for furnace coke for April shipment, some of this business being placed at $10 flat per net ton and some at $10.50 to $11 per ton. The output of coke in the upper and lower Connellsville regions last week was slightly over 248,000 tons, but this week will show a large loss in output due to the shutdown of so many plants on account of the railroad strike. We quote standard grades of blast furnace coke at $10 to $11 and standard grades of 72-hr. foundry coke at $11 to $12 per net ton at oven.

Old Material.—For two months or longer local consumers of scrap have been out of the market as buyers, having had sufficient stocks to carry them over this period, and with their utter indifference at present being shown it is evident they still have scrap to meet their needs for some time to come. While it is true consumers have been pulling on stocks heavily for some time, they do not show any willingness yet to make purchases. Dealers are getting somewhat uneasy and are now willing to accept lower prices for scrap than they would have taken a month or more ago. It is stated stocks at nearly all scrap producing centers are heavy, and there is still a good deal of scrap material owned by the Government that has not yet been sold. Dealers have thought right along that the high prices ruling for pig iron would not only sustain prices of scrap, but would also probably advance them but this has not been the case. Dealers are showing more anxiety to make sales and are naming lower prices to consumers, but as yet without results. The consumption of scrap by the mills is heavy and it is very evident present lack of buying must end soon. Two local consumers are said to have nearly reached the end of their stocks and may possibly come in the market within a short time and buy. Prices had gone off fully $1 per ton, and on some grades a larger decline has taken place.

We quote for delivery to consumers' mills in the Pittsburgh and other districts that take Pittsburgh freight rates as follows:

Heavy melting steel, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh, delivered	$25.50 to $26.00
No. 1 cast for steel plants	33.00 to 34.00
Rerolling rails, Newark and Cambridge, Ohio; Cumberland, Md.; Franklin, Pa., and Pittsburgh	32.00 to 33.00
Compressed steel	21.50 to 22.00
Bundles, sheet sides and ends, f.o.b. consumers' mills, Pittsburgh district	17.00 to 18.00
Bundled sheet stamping	16.00 to 17.00
No. 1 busheling	18.00 to 18.50
Railroad grate bars	26.00 to 27.00
Low phosphorus melting stock (bloom and billet ends, heavy plates) ¼ in. and heavier	30.00 to 31.00
Railroad malleable	29.00 to 30.00
Iron car axles	37.00 to 38.00
Locomotive axles, steel	32.00 to 33.00
Steel car axles	30.00 to 31.00
Cast iron wheels	40.00 to 41.00
Rolled steel wheels	28.00 to 29.00
Machine shop turnings	16.50 to 17.00
Sheet bar crop ends (at origin)	29.00 to 29.50
Heavy steel axle turnings	20.00 to 21.00
Heavy breakable cast	32.00 to 33.00
Cast iron borings	18.00 to 18.50
No. 1 railroad wrought	32.00 to 33.00

An ordinance recently passed by the Chicago city council places practically all iron, steel and metalworking industries in the city under a license system, which calls for the payment of an annual fee, ranging from $25 to $200, according to the number of employees. The ordinance owes its existence to the loss in revenues resulting from the cessation of liquor license payments.

BRITISH STEEL MAKERS PROTEST

Unsettlement in Industry Deplored and Curative Measures Urged

LONDON, March 26.—The serious handicaps with which British iron and steel makers are contending are emphasized by the action taken at the annual meeting of the National Federation of Iron and Steel Manufacturers held at the Hyde Park Hotel, yesterday, with G. Scoby-Smith presiding. One resolution passed declared that the unsettled industrial conditions indicated by rising prices, increased cost of living and deterioration of exchange could only be improved by the development of export trade to the fullest extent. Another viewed with grave concern the continued increase in the price of commodities caused by deficiency of supply and the depreciation of currency.

Alarm was expressed in a third resolution at the chaotic condition of the coal industry. It was declared that apart from measures to prevent the export of coal at the expense of home industries, its production and distribution to industry should be permitted to follow its natural course. The delay in reconstruction of rolling stock for the railroads was deplored and the Government was urged to reappoint the committee of 1918 to consider the whole railroad problem, as the failure of transport service was largely the cause of increases in cost of production and of short supply of commodities.

It was the consensus of opinion at the meeting that the iron and steel trades should be allowed to determine their own conditions of employment and wages by collective agreement between organizations of employers and workmen, also that a special scheme should be prepared for dealing with unemployment in the iron and steel trades. The proposals for a levy on capital and the taxation of special war wealth were disapproved of as impracticable. The abolition of the excess profits tax was urged, its place to be taken by a special tax upon industrial profits.

W. T. Layton, the director of the federation, reported at the meeting that the organization now represents 85 per cent of the total iron producing capacity of the country, and 97 per cent of the steel producing capacity.

Baltimore Chapter of Steel Treaters

The Baltimore Chapter of the American Steel Treaters Society was inaugurated at a largely attended meeting at the Hotel Emerson, Baltimore, Thursday evening, April 1. All of the larger companies in the district were represented. The chairman of the new chapter is Charles H. Breed, metallurgist, Crown Cork & Seal Co.; vice-chairman, H. A. Brooks, superintendent Bartlett & Hayward Co.; secretary-treasurer, S. Wilson Morrow, vice-president Reus Bros. Co. The executive committee consists of William L. Ball, metallurgist Black & Decker Mfg. Co.; William H. Keen, superintendent tool steel plant Hess Steel Corporation; C. P. Van Gundry, chief chemist Baltimore & Ohio Railroad, and William H. Stoffel, testing inspector Bethlehem Steel Co. This new chapter makes the twenty-first in the national organization.

During the first quarter the sum of $23,478,965 was distributed in wages in Youngstown, Ohio, principally by the steel companies; $7,951,935 in March, $7,987,542 in February and $7,539,488 in January. This compares with $22,885,736 disbursed in wages in the corresponding quarter in 1919, and the 1920 distribution is the largest in the history of the district. The reduction of $35,607 for March from February reflects curtailment due to ragged fuel supplies.

Chicago

CHICAGO, April 13.

Steel production in the Chicago metropolitan district has been severely curtailed because of the switchmen's strike. The leading interest is operating but five blast furnaces each at South Chicago and Gary, or a total of 10 out of 23. Its mill output has also been cut down to about 50 per cent of normal. The Inland Steel Co. continues to operate its three blast furnaces, but is rolling steel at the rate of about one-half of capacity. The plants of the Interstate Iron & Steel Co. at South Chicago, Grand Crossing and East Chicago, have been shut down. The Wisconsin Steel Works, South Chicago, has banked one blast furnace out of three, and has been forced to reduce mill operation to about 50 per cent of normal. The Calumet Steel Co., Chicago Heights, the Riverdale Iron & Steel Co., Riverdale and the Highland Iron & Steel Co., West Pullman, Ill., and Terre Haute, Ind., are all closed. The plants of the Republic Iron & Steel Co. and the Steel and Tube Company of America have not yet found it necessary to curtail operation materially. None of the blast furnaces of the latter interest has been forced to bank and one of its local stacks continues to ship merchant iron. In Joliet the plant of the foremost steel producer has not yet reduced output, and the same is true of the branch at Milwaukee, although that city is isolated and no inbound or outbound shipments are moving.

There is little change in the strike situation here. Although a few men are returning to work every day, the bulk of the switchmen in Chicago are still out. More encouraging reports come from other points in this territory. At Bloomington, Ill.; DuQuoin, and Dayton, Ohio, the men to-day voted to return to work. In the opinion of some competent observers, there is collusion between the established railroad unions and the strikers, despite the fact that the former publicly proclaim their disapproval of the action of the men. It is thought improbable that a local disturbance would have spread throughout the entire country unless plans had been laid through the usual channels of communication. It is pointed out that the policy of the union officers, if this, in fact, is their policy, makes due allowance for any possible outcome of the strike. If the walkout proves a failure, they can claim the credit and their organizations will remain unimpaired. If the strike succeeds, they may offer the excuse that the men acted on their own initiative and refused to heed their advice.

Naturally the strike has clouded the iron and steel market for the time being, and business has slowed up materially. The present and potential demand for finished iron and steel products, however, is considerable. Inquiry for structural steel has fallen off somewhat and a decline in construction activity in the southwestern oil fields has made the situation in plates a bit easier, but there seems to be no relief in sight in bars, sheets, wire products and bolts and nuts. It is worth noting that jobbers' stocks in sheets and bars are very seriously depleted and manufacturers likewise are finding it exceedingly difficult to secure their imperative needs. Cast iron pipe, pig iron and scrap are inactive.

Pig Iron.—The railroad strike has brought activity in this market to a halt. Aside from a limited amount of spot business moving to points outside this metropolitan district, buying has been suspended. Because of foresight in providing reserve fuel stocks, the leading merchant iron interest has not yet been forced to curtail operation either in its local or outside plants. Up to date it has succeeded in moving shipments from its Duluth and Mayville furnaces, as well as from one of its local stacks. This producer, as has been previously indicated, has taken care of the needs of its customers for the remainder of the year, and therefore expects to take little additional business. It is probable that it may be able to help a customer in case of emergency, and, in fact, has done so in a few instances of late, when old connections found that they urgently required tonnage in excess of what they had contracted for. The largest transaction of recent date was closed last week and involves 500 tons of foundry for last half delivery, bought by a Wisconsin foundry at $40, base, Birmingham. Southern furnaces which have been quoting that price are steadily withdrawing from the market, pointing to a return to the former ruling price of $42. A Tennessee and a Jackson County producer of silveries have withdrawn quotations and other makers have announced advances of $2.50 a ton. The Thomas furnace, Milwaukee, expects to go in blast in about 30 days, and has recently taken business in both copper free low phosphorus and malleable in anticipation of that event. This stack still has considerable open capacity for the rest of the year.

Charcoal iron is now firm at $55, base furnace. One producer is entirely sold out for the year, and others are booked to the extent of 90 or 95 per cent of their remaining capacity. Current inquiries are few, as consumers are covered, in most cases, for their requirements for the year.

The following quotations are for iron delivered at consumers' yards except those for Northern foundry, malleable and steel-making irons, including low phosphorus, which are f.o.b. furnace and do not include a switching charge averaging 50c. per ton.

Lake Superior charcoal, average sil. 1.50 (other grades subject to usual differentials), deliv. at Chicago...	$57.50
Northern coke, No. 1 sil. 2.25 to 2.75	45.25
Northern coke foundry, No. 2, sil. 1.75 to 2.25	43.00
Northern high phos. foundry	43.00
Southern coke, No. 1 foundry and No. 1 soft, sil. 2.75 to 3.25	$48.20 to 50.20
Southern coke, No. 2 foundry, sil. 2.25 to 2.75	46.70 to 48.70
Southern foundry, sil. 1.75 to 2.25	45.00 to 47.00
Malleable, not over 2.25 sil	43.50
Basic	42.00
Low phos. (copper free)	53.00
Silvery, 7 per cent	59.30

Ferroalloys.—There is little activity in this market. Apparently consumers hesitate to pay as much as $200 for ferromanganese for last half shipment and $250 for spot material.

We quote 76 to 80 per cent ferromanganese, last half, $200; spot, $235 to $250; 50 per cent ferrosilicon at $85 delivered; spiegeleisen, 18 to 22 per cent, $60 furnace.

Railroad Rolling Stock.—A number of notable new inquiries have made their appearance. The New York Central wants 1800 stock cars in addition to the 8000 freight cars sought last week. The Southern Pacific is in the market for 500 automobile cars and 250 ballast The Pennsylvania will let repairs on 1000 hopper cars, involving about 7000 tons of plates and shapes. The Baltimore & Ohio has added 1000 box car bodies, 600 hopper car bodies and 500 refrigerator car bodies to the 2100 car bodies erroneously reported as an inquiry for complete cars a week ago. The Sinclair Refining Co. has bought 500 tank cars from the General American Tank Car Corporation and has ordered 350 box cars from the American Car & Foundry Co. The same car builder has received orders from the Pennsylvania Coal Co. for 500 mine cars and from the Hudson & Manhattan for 25 motor passenger car bodies. The Buffalo, Rochester & Pittsburgh will let repairs on 2000 hopper cars. The Chicago, Rock Island & Pacific has bought 35 locomotives from the American Locomotive Co. The Burlington is in the market for 15 mikado type and 15 Santa Fe type engines, and the Missouri Pacific is reported inquiring for 15 mikado type locomotives. The Des Moines Terminal Railroad wants five engines.

Plates.—Despite labor difficulties and the tendency toward pessimism, particularly evident in financial circles, the demand for steel products, with the possible exception of structural steel, is as insistent as ever. Apparently the imperative needs of consumers are alone so large as to tax the capacity of steel plants. The interruption in production resulting from the railroad strike only makes the situation worse. In the opinion of a prominent member of the trade, relief is not in sight, as the foreign market stands ready to take up any slack in domestic demand. Despite the evident elements of strength, the price situation is more or less confused. Although the Steel Corporation has repeatedly announced that its further commitments would be limited to old customers, many other consumers entertain the hope that they will be able to secure their needs from that source and therefore hesitate to make contracts with independents at higher prices. Because of increased labor, fuel and raw material costs and

expensive interruptions in operation, independent interests assert that they cannot meet Steel Corporation prices. The leading interest, it is stated, exports about one-sixth of its output and the favorable terms under which that business is being closed may account for its ability to hold down its domestic prices. At the same time, the independents realize that the prices they must ask may reduce their contract business to a minimum and result in their disposing of most of their remaining output for the year in the open market. The foremost local independent, which has an overlap of first half business running almost to fourth quarter, has not yet announced its last half prices. One of the leading Eastern factors in this market, which has followed the policy of taking specific orders rather than contracts, now has bookings for little more than 60 days ahead, and is consistently selling at 4½c. for light gage plates, 4c. for heavy plates, 4c. for structural steel, and 4½c. for mild steel bars, all f.o.b. Pittsburgh or equivalent. Of current orders for plates, those resulting from railroad car orders are most prominent. The foremost interest will furnish about 15,000 tons of plates and shapes for 2000 box cars recently ordered by the Grand Trunk from the American Car & Foundry Co. It will also probably supply 20,000 tons of plates and shapes and at least 425 tons of axles for 2250 cars out of the 8000 purchased last week by the New York Central. This tonnage is subject to modification according to the final decision of one of the car builders as to the distribution of its share of the order among its various shops.

The mill quotation is 2.65c. to 4c., Pittsburgh, the freight to Chicago being 27c. per 100 lb. Jobbers quote 4.17c. for plates out of stock.

Structural Material.—While the demand for structural shapes continues to lag behind bars, sheets and plates, there remains an encouraging rate of activity in the fabricating field. A contract for 4100 tons involved in the construction of the Kansas City Federal Reserve Bank has been awarded to the Fort Pitt Bridge Works. A 13,000-ton project, the Cincinnati Southern bridge, Cincinnati, which was noted in this column some months ago, has finally come to a head, the tenders of fabricators now being in the hands of Ralph Modjeski, engineer in charge. On plain material the leading interest continues to quote 2.45c., Pittsburgh, accepting such additional tonnage as it can from old customers. This business, however, is subject to indefinite delivery. Eastern interests continue to sell at 4c., Pittsburgh, while the leading local independent has not yet fixed its last half prices. Recent fabricating awards include:

Newport Co., chemical plant additions, Milwaukee, 700 tons, to Worden-Allen Co.

Chicago, Burlington & Quincy, miscellaneous material, 383 tons, to an unnamed fabricator.

Henry E. Pridmore, foundry building, Chicago, 373 tons, to Federal Bridge & Structural Co.

People's Banking & Trust Co., building, Marietta, Ohio, 321 tons, to American Bridge Co.

National Brake & Electric Co., alterations and additions to open-hearth buildings, Milwaukee, 300 tons, to Worden-Allen Co.

Milwaukee Coke & Gas Co., boiler house, Milwaukee, 250 tons, to Worden-Allen Co.

Hoskins Morainville Paper Co., mill building, Menominee, Mich., 216 tons, to Worden-Allen Co.

Savage Tire Co., warehouse, San Diego, Cal., 197 tons, to California Iron Works, San Diego.

Current inquiries include:

Main Street bascule bridge, Kenosha, Wis., 728 tons, to be sublet by Greiling Brothers, general contractors, Kenosha.

Interstate Iron & Steel Co., pit furnace building, South Chicago, 100 tons.

The mill quotation is 2.45c. to 4c., Pittsburgh, which takes a freight rate of 27c. per 100 lb. for Chicago delivery. Jobbers quote 3.97c. for materials out of warehouse.

Bars.—The leading independent has not yet announced its prices on mild steel bars for last half shipment. The foremost interest's price of 2.35c., Pittsburgh, is nominal because that mill is sold out for the year. This means that consumers must continue to look for their needs elsewhere. While there continues to be a strong demand for bar iron and rail carbon bars, the mills are less disposed to take business, not only because they are well sold but because most of them are closed on account of the railroad strike.

Mill prices are: Mild steel bars, 2.35c. to 4.50c., Pittsburgh, taking a freight of 27c. per 100 lb.; common bar iron, 3.75c., Chicago; rail carbon, 3.75c., mill. Jobbers quote 3.87c. for steel bars out of warehouse.

Sheets.—There is little change in the situation, except that there seems to be more selling by unattached brokers at high prices.

Mill quotations are 4.35c. to 6.50c. for No. 28 black; 3.55c. to 6c. for No. 10 blue annealed, and 5.75c. to 8.50c. for No. 28 galvanized, these all being Pittsburgh prices, subject to a freight of 27c. per 100 lb. to Chicago. The lowest prices are those of March 21.

Jobbers quote, Chicago delivery out of stock No. 10 blue annealed, 6.52c.; No. 28 black, 7.50c.; No. 28 galvanized, 9c.

Wire Products.—Speculators have apparently added wire products to their list. According to report, brokers of this stripe have recently sold nails at from $6.50 to $9 base per keg. The rail strike has not yet forced the Western plants of the leading interest to curtail operation materially, but the Grand Crossing works of the Interstate Iron & Steel Co. has been closed. For mill prices, see finished iron and steel, f.o.b. Pittsburgh, page 1137.

Rails and Track Supplies.—A Southwestern road is inquiring for 25,000 tons of standard section rails for 1921 delivery. Demand for light standard sections, light rails and track fastenings continues heavy, some orders for indefinite delivery being taken by the leading interest. A large Eastern independent and a number of Western rerolling mills are quoting as high as 3½c. on light rails and have booked orders at that price.

Standard Bessemer rails, $45 to $55; open hearth rails, $47 to $57. Light rails, 2.45c. to 3.50c. f.o.b. makers' mills.

Standard railroad spikes, 3.55c. to 4c. Pittsburgh. Track bolts with square nuts, 4.90c. to 5c., Pittsburgh. Steel tie plates and steel angle bars, 2.75c., Pittsburgh and Chicago; tie plates, iron, 3.75c., f.o.b. makers' mills.

Cast Iron Pipe.—There is a dearth of advertised business, current orders and inquiries being confined to industrials and small municipalities which do not ask for public bids. Considerable business is expected to develop in May and June, as many moderate sized cities are wont to place their orders at that time. Many of the large cities of the country, however, have deferred their purchases until next year. Their present needs, representing the accumulated requirements of the war period, together with those which accrue during the current year, constitute a potential demand of large proportions. Pipe foundries, therefore, look for good business for several years.

We quote per net ton f.o.b. Chicago, ex-war tax, as follows: Water pipe, 4-in., $75.80 to $77.80; 6-in. and above, $72.80 to $74.80; class A and gas pipe, $2 extra.

Old Material.—The scrap market, which is an exceedingly sensitive barometer of business conditions, has been adversely affected by the railroad strike. Trading is at a standstill and while offerings indicate a soft market, the prices quoted below must be considered as nominal. The Santa Fe offers 2000 tons, the St. Paul 1200, the Grand Trunk Western 110 tons, and the Michigan Central a blind list.

We quote delivery in consumers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

	Per Gross Ton	
Iron rails	$33.00	to $34.00
Relaying rails	40.00	to 50.00
Car wheels	37.00	to 38.00
Steel rails, rerolling	32.00	to 33.00
Steel rails, less than 3 ft.	28.50	to 29.00
Heavy melting steel	23.50	to 24.00
Frogs, switches and guards, cut apart	23.50	to 24.00
Shoveling steel	23.00	to 23.50
Low phos. heavy melting steel	28.00	to 28.50
Drop forge flashings	18.50	to 19.50
	Per Net Ton	
Iron angles and splice bars	$30.50	to $31.50
Steel angle bars	24.00	to 24.50
Iron arch bars and transoms	31.50	to 32.50
Iron car axles	39.00	to 40.00
Steel car axles	32.50	to 33.50
No. 1 busheling	20.00	to 21.00
No. 2 busheling	14.50	to 15.00
Cut forge	24.00	to 24.50
Pipes and flues	17.50	to 18.00
No. 1 railroad wrought	27.00	to 27.50
No. 2 railroad wrought	24.00	to 24.50
Steel knuckles and couplers	23.50	to 24.00
Coil springs	25.00	to 25.50
No. 1 cast	37.00	to 37.50
Boiler punchings	24.00	to 24.50
Locomotive tires, smooth	24.00	to 24.50
Machine shop turnings	12.00	to 12.50
Cast borings	14.00	to 14.50
Stove plate	30.00	to 30.50
Grate bars	29.50	to 30.00
Brake shoes	25.50	to 26.00
Railroad malleable	27.00	to 28.00
Agricultural malleable	26.50	to 27.00
Country mixed	17.50	to 18.50

Bolts and Nuts.—The representative of a leading maker characterizes the situation in bolts and nuts as hopeless. Production, which has been by no means

satisfactory because of the shortage of raw material, is now further reduced by the railroad strike. The actions of consumers, on the other hand, have not been conducive to stability in prices. Purchasing agents have been sent out to scour the country for bolts and nuts needed to complete equipment in the course of manufacture. Because of the acute shortage of this product, their interest has been in getting their needs regardless of price. The shortage of bolt and nut stock which has been particularly noticeable in the smaller sizes has resulted in advances of about 10 per cent in the smaller bolts by a number of prominent manufacturers. They now quote small machine bolts in rolled threads at 40 and 5 off and in cut threads at 30 and 10 off. Carriage bolts, ⅜ x 6 in. and smaller, are quoted at 30 and 10 off for rolled threads and 30 off for cut threads. For mill prices see finished iron and steel, f.o.b. Pittsburgh, page 1137.

Jobbers quote structural rivets, 5.37c.; boiler rivets, 5.47c.; machine bolts up to ⅞ x 4 in., 30 per cent off; larger sizes, 20 off; carriage bolts up to ⅞ x 6 in., 20 off; larger sizes, 15 off; hot pressed nuts, square tapped and hexagon tapped, 50c. off; coach or lag screws, gimlet points, square heads, 40 per cent off. Quantity extras are unchanged.

Buffalo

BUFFALO, April 12.

Pig Iron.—The pig iron market has been very quiet during the week. The inquiry has not been heavy, due to the fact that about every large consumer has covered his requirements for the rest of the year. Sales have been only nominal, with only a couple of thousand tons sold all week. This was foundry iron, and the main part of it was No. 2X, 2.25 to 2.75 silicon content, at the regular price of $46.25. This price now seems to be very well established in this market, as does the $45 base price for 1.75 to 2.25 silicon, and $48 for 2.75 to 3.25 silicon. There was one inquiry for 10,000 tons of basic during the week, which is the main feature of the market. So far as can be learned, this tonnage was not taken. This tonnage followed two other basic inquiries of three weeks ago, one for 6000 tons and one for 4000 tons, neither of which was taken in this market. These inquiries were later, it is believed, withdrawn from the market. The switchmen's strike came at a very inopportune time, as most furnaces were just prior to it making excellent shipping arrangements. The Rogers-Brown Iron Co. had just placed its fourth furnace in blast, following the strike troubles of last September. The four furnaces are still operating. The Donner furnaces are running light. The Buffalo Union and Wickwire furnaces are still running, but they will have to be banked if the strike continues.

We quote f.o.b. Buffalo:

No. 1 foundry, 2.75 to 3.25 sil.	$48.00
No. 2 X foundry, 2.25 to 2.75 sil.	46.25
No. 2 plain, 1.75 to 2.25 sil.	45.00
Basic	$43.00 to 44.00
Malleable	46.25
Lake Superior charcoal	58.00 to 60.00

Finished Iron and Steel.—The strike of the switchmen has played havoc with the iron and steel industry here. Buffalo is one of the embargoed points, and hardly a ton of material is leaving the city. One local mill was able to make shipment Saturday by using its own locomotives to haul cars to the main line of the New York Central, where the cars were hooked on to a through train. The strike of yard switchmen has effectually stopped operations of most steel mills. The Lackawanna Steel Co. is operating only those units necessary to keep the plant alive. The machine shop, all the rolling mills are down and furnaces are being banked. The Donner Steel Co. is running some of its mills, but expects to have to close down shortly. The Wickwire Steel Co. mills are running and will continue for possibly the next three or four days. Road crews were imported by the railroads to handle Buffalo yard switching, but these quit in most instances, leaving the mills with no incoming fuel. The only relief the railroads can give the mills is to send in an occasional carload of supplies, with what frequency they can.

The demand for finished iron and steel is not as intensive, but may be described as more sane. It is still very strong, and this applies particularly to the small classes of cold-finished material and small rounds in hot-rolled bars. Tin plate and wire products are eagerly sought. Plates and structural shapes are a little easier. Very little tonnage was accepted by mills, and the present strike trouble makes them less eager than ever to take on commitment. Most mills have orders booked ahead to the end of the third quarter.

Jobbers quote the following prices for this territory: Steel bars, 4.61c.; iron bars, 5.26c.; structurals, 4.46c.; plates, 4.66c.; No. 10 blue annealed sheets, 6.51c.; No. 28 black sheets, 8.25c.; No. 28 galvanized sheets, 9.50c.; bands, 5.81c.; hoops, 6.06c.; cold rolled steel, 6.00c.

Old Material.—The scrap market has been paralyzed by the suspension of railroad activities. No material is coming in or moving out and there is not even any local switching of cars. Prior to the strike, there had been a practical cessation of buying by the mills, and it is doubtful whether the market would have held up for very much longer because of the inactivity. There has been just enough activity in all the grades for the previous two weeks to sustain the market until the time of the switchmen's strike. Dealers are now busy in their yards checking up stock. There have been considerable rejections of shipments and this has made dealers somewhat more cautious.

We quote dealers' asking prices, per gross ton f.o.b. Buffalo, as follows:

Heavy melting steel, regular grades	$25.00 to $26.00
Low phos., 0.04 and under	32.00 to 33.00
No. 1 railroad wrought	31.00 to 32.00
No. 1 machinery cast	38.00 to 39.00
Iron axles	40.00
Steel axles	41.00 to 42.00
Car wheels	37.00 to 38.00
Railroad malleable	31.00 to 32.00
Machine-shop turnings	16.50 to 17.00
Heavy axle turnings	20.00 to 21.00
Clean cast borings	17.00 to 18.00
Iron rail	30.00 to 31.00
Locomotive grate bars	24.00 to 25.00
Stove plate	32.00 to 33.00
Wrought pipe	21.00 to 22.00
No. 1 busheling	20.00 to 21.00
Bundled sheet stamping	17.00 to 18.00

Birmingham

BIRMINGHAM, ALA., April 13.

Pig Iron.—Holders for $42 base agree that the iron market is stronger and report sales of round tonnages at that figure. Lots of 1000 and 900 tons for strictly Southern delivery brought $42, while a 1400 ton lot for Middle Western delivery brought the same. At the same time the leading interest has continued to sell at $38, and is known to have booked a number of orders at that base during the past week, including a round lot for Southern delivery and one of around 800 to 1000 tons for the middle West. One interest is on a $40 base, but the usual is $40 to $42, according to desirability of the business, with the leading interest remaining hard and fast at $38. The outlaw railroad strike will, it is believed, cause a rush on Southern makers for spot metal. There is a considerable inquiry in that way already. There is an apparent demand for all that can be produced, and makers holding for the high levels are as firm as ever. Furnace operations are excellent and some records are being made. Iron masters themselves opened their eyes when it became known that No. 2 stack of the Tennessee company at Ensley produced 18,890 tons of iron in March, an average of over 600 tons per diem, compared with the Alabama average of around 300 tons. The five Ensley stacks produced in March 70,512 tons, an average per stack of 14,122, compared with an Alabama average of 8500 tons. The Alabama Co. will blow in its relined stack at Gadsden during the week. The Alabama March output shows an increase of 20,000 tons over the same month in 1919. The Sloss-Sheffield four city furnaces should work in an improved manner from now on with the 1800 tons of coke per diem available from the new by-product plant.

We quote per gross ton, f.o.b. Birmingham district furnaces, the Tennessee company excepted, as follows:

Foundry, sil., 1.75 to 2.25	$40.00 to $42.00
Basic	39.00 to 41.00
Charcoal	55.00

Cast Iron Pipe.—Emergency Fleet Corporation ship "Delisle" left Mobile Saturday for Los Angeles and San Francisco with 3000 tons of water and gas pipe fur-

nished by the United States Cast Iron Pipe & Foundry Co. The American Cast Iron Pipe Co. is succeeding in the manufacture of light weight cast iron pipe by electric process. Small sizes of water pipe are being ordered in quantities. All makers of pipe of whatsoever kind are busy. Price schedules have not changed.

Coal and Coke.—The new schedule on Brookwood 72-hour coke is $11 and Majestic runs as high as $12. Very little goes out of the district on account of car shortage and the local demand. Coal output has slightly declined. Miners wish recognition of the union, but have made no formal demand. The Sloss-Sheffield company began operations in 60 of its 120 new by-product ovens during the week. This is a $6,000,000 plant. The Alabama By-Products Co. has contracted with the Barrett Mfg. Co. for disposal of its tar products. The latter has a plant at Fairfield, near Birmingham.

Old Material.—Yardmen report a slackening in the demand for mixed scrap and steel, but a continued healthy one for No. 1 and other cast grades. Large consumers are admittedly out of the market for steel for the time being and have turned down proffers even at the conservative quotations.

We quote per gross ton, f.o.b. Birmingham district yards, prices to consumers, as follows:

Steel rails	$21.00 to $21.50
No. 1 heavy steel	20.00 to 20.50
Cast-iron borings	11.00 to 11.50
Machine-shop turnings	11.00 to 11.50
Stove plate	24.00 to 24.50
No. 1 cast	31.00 to 32.00
Car wheels	30.00 to 31.00
Tramcar wheels	28.00 to 29.00
Steel axles	29.00 to 30.00
No. 1 wrought	21.00 to 21.50

Cleveland

CLEVELAND, April 13.

Iron Ore.—The switchmen's strike and embargoes have resulted in almost complete tie-up of the lower Lake ore docks. Ore is being loaded at two Ashtabula docks and at the Erie plant at Randall, but none is being shipped from these docks. The Pennsylvania dock at Erie and the Pittsburgh & Lake Erie dock at Conneaut are still operating, but men at the latter are expected to go out to-day. A little ore is being loaded at one Lorain dock, but other docks west of Buffalo are idle. The strike will result in some delay in opening the season of navigation, for until normal conditions are resumed, little will be done toward sending boats for their first cargoes. In addition the cold weather for the past few days will tend to further delay the opening date.

We quote, delivered, lower Lake ports: Old range Bessemer, $7.45; old range non-Bessemer, $6.70; Mesaba Bessemer, $7.20; Mesaba non-Bessemer, $6.55.

Pig Iron.—Most of the furnaces continue to operate in this territory, but many will have to bank for lack of fuel should the railroad strike last many days. While furnace operations so far have not been seriously affected, every ton of iron that has been made by merchant furnaces in Cleveland and northern Ohio territories since last Friday has been put in stock piles, and some furnaces have been piling their iron since Thursday. Industrial railroads, however, have continued to operate and have moved some iron from furnaces to allied steel plants. Last week, before the tie-up, the supply of cars became more plentiful and furnaces expected to get their yard stocks well cleaned up this month before the shortage of cars again became more acute with the opening of the season of navigation. Should the blast furnace operations be seriously curtailed by the strike, a tightening of the market is expected, as some of the furnaces are already sold up for the year and will have less additional iron to offer than would have been available were operations not interfered with. The market is very quiet in this territory, but considerable inquiry for foundry iron is coming from the East. Sales for the most part have been limited to small lots, and the only sale of any size reported is 1500 tons for the last half taken by a Michigan automobile foundry. Among inquiries is one from a Newark, N. J., consumer for 3000 tons of malleable iron for the third quarter. A southern Ohio steel plant is inquiring for 8000 to 10,000 tons of basic for the second quarter. Prices are very firm at $43 for foundry iron for future delivery and $44 to $45 for prompt shipment. Small lot sales of Southern iron are reported on the basis of $42 and Ohio silvery at $55. One silvery furnace has withdrawn from the market.

We quote, delivered Cleveland, as follows, based on 40c. switching charge for local iron, a $1.40 freight rate from Valley points and $5 from Birmingham:

Basic	$43.40
Northern No. 2 foundry, sil. 1.75 to 2.25	43.40
Southern foundry, sil. 2.25 to 2.75	$46.25 to 49.70
Gray forge	41.40
Ohio silvery, sil. 8 per cent	58.40 to 61.40
Standard low phos., Valley furnace	48.00 to 50.00

Coke.—Many foundries are placing contracts for Connellsville foundry coke for either the full year or the last half at prices ranging from $10 to $12 per net ton at oven. One maker is quoting a flat price of $11 for the 6 or 12 months delivery. Most other contracts, however, have labor clauses. For spot shipment the ruling price is $12, but very little activity is reported in early shipment coke.

Bolts, Nuts and Rivets.—Bolt and nut manufacturers are getting a heavy volume of specifications on contracts and considerable new business is coming out. Prices are firm. Rivet consumers are placing contracts for the second quarter and there is a fair volume of small current orders for rivets, but no large inquiries have developed recently.

Finished Iron and Steel.—The demand for steel is becoming lighter in most lines and the feeling is growing among consumers that the peak has been reached and there will be a gradual easing up in the supply and prices. However, a tightening of the situation is threatened by the shutting down of the mills because of the strike. Following the marked falling off in building work due to the high cost, some fabricators are showing a desire to reduce their stock of plain material, and round lots of this are being offered for resale at 4.25c. Light plates are easier, but the demand for heavy gages which recently quieted down has increased with new inquiries for 15,000 to 20,000 tons about equally divided between ship and tank plates. Some of the ship plates are wanted for export. Plates for early shipment are quoted at 3.75c. to 4c. The demand for sheets in light gages continues very heavy. One Valley mill is now quoting galvanized sheets at 9.25c. for early shipment. Blue-annealed sheets are quoted at 6c. to 6.50c. for No. 10. Structural awards included 250 tons in connection with a Standard Oil Co. refinery in Toledo taken by the Mount Vernon Bridge Co., 150 tons for an extension to the plant of the Champion Engineering Co., Kenton, Ohio, taken by the Bellefontaine Bridge & Steel Co., and 200 tons for a manufacturing plant in Grafton, taken by the Fort Pitt Bridge Works. The Clover Leaf Railroad has placed an additional order with a Buffalo mill for 2500 tons of rails and the Southern Pacific Railroad is inquiring for 40 locomotives.

Cleveland warehouses quote steel bars at 3.27c. to 5c.; plates 3.57c. to 5c.; and structural material 3.70c. to 5.10c.

Old Material.—Scrap prices have further declined and nearly all grades are weak with the exception of cast scrap. The railroad strike apparently has not had any particular effect on prices, which have showed a downward tendency for two weeks or more, but has brought business almost to a standstill, as no scrap is being moved. A Cleveland mill purchased some heavy melting steel during the week at $24.50 but later offered only $24 for this grade, and another mill was quoted $23.50 on a 1000-ton lot, but the reduction in price did not result in a sale. One Valley mill purchased about 5000 tons at $25. A local dealer purchased 3000 tons of heavy melting steel scrap from a shipyard at $22.50. Low phosphorus melting scrap has declined about $1 per ton, and railroad grate bars sold during the week at $26, as compared with a maximum price of $32 brought by this grade recently. There is no local demand for busheling, and this grade is particularly weak. Local dealers are offering as

low as $18 for No. 1 busheling. For No. 1 cast $43 is being offered. This grade recently sold as high as $45.

We quote, per gross ton delivered consumers' yards in Cleveland and vicinity, as follows:

Heavy melting steel	$24.00 to $24.50
Steel rails, under 3 ft	27.25 to 27.75
Steel rails, rerolling	31.00 to 32.00
Iron rails	32.00 to 33.00
Iron car axles	41.00 to 42.00
Steel car axles	36.00 to 37.00
Low phos. melting scrap	26.25 to 26.50
Cast borings	17.00 to 17.25
Iron and steel turnings and drillings	14.25 to 14.75
Short turnings for blast furnaces	17.00 to 17.25
Railroad wrought	28.00 to 29.00
Railroad malleable	31.00 to 32.00
Agricultural malleable	26.50 to 27.00
Steel axle turnings	20.00 to 20.50
Light bundle sheet scrap	15.00 to 15.50
Drop forge flashings, over 10 in.	17.00 to 17.50
No. 1 busheling	19.00 to 19.50
Railroad grate bars	26.00 to 26.50
Stove plate	29.00 to 30.00

Boston

BOSTON, April 13.

Pig Iron.—Sales during the past week have dropped to approximately 5000 tons, the recent buying movement being but a flurry. Only one large inquiry is in the market; 3000 tons high silicon, of which 1200 tons is for silicon 4.00 to 5.00, and the remainder for silicon 3.25 to 3.75, third and fourth quarter, from a Connecticut consumer. Buffalo and Pennsylvania prices are mixed. One of the largest Buffalo furnaces has sold No. 2 X on a $45 furnace base; another a small tonnage on a $44 base, and there have been additional sales of resale iron at that price; while another interest offers a round tonnage of last half, silicon 2.75 to 3.25, at $42 furnace. An eastern Pennsylvania furnace has sold between 800 and 900 tons No. 2 plain and No. 2 X, last half delivery, at $46 furnace base, an advance of $1; another has raised its price from $44 to $45 base; local interests have sold 1300 tons last half No. 2 plain at $45 furnace and silicon 2.25 to 2.75 at $46, a $1 differential, as compared with $1.25, the standard practice; while an eastern Pennsylvania furnace has sold small and offers large tonnages of third quarter iron at $43 furnace base with a $1 differential. A small tonnage of Pennsylvania iron, silicon 3.50 and over, sold to a Massachusetts consumer at $50.50 furnace. Some 100 and 200-ton lots of Alabama, silicon 2.25 to 2.75, and No. 1 X sold on a $42 furnace base, and a little Virginia No. 2 X at $43 furnace, but Virginia furnaces in most cases are not offering iron on this market. Delivered pig iron prices follow:

East. Penn., sil., 2.25 to 2.75	$46.90 to $50.15
East. Penn., sil., 1.75 to 2.25	45.90 to 48.90
Buffalo, sil., 2.25 to 2.75	49.15 to 50.15
Buffalo, sil., 1.75 to 2.25	47.90 to 48.90
Virginia, sil., 2.25 to 2.75	48.95
Virginia, sil., 1.75 to 2.25	47.70
*Alabama, sil., 2.25 to 2.75	48.35 to 50.35
*Alabama, sil., 1.75 to 2.25	46.75 to 48.75

*Alongside Boston prices.

Coke.—Early in the week, the Providence Gas Co. raised its sliding scale contract price to $14 on a misrepresentation of Connellsville quotations, but within a short time dropped its price to $11. No contract coke was billed out on a $14 base. The New England Coal & Coke Co.'s sliding scale contract price is $10. Both concerns quote spot coke at $15.40 delivered, but none is available.

Finished Iron and Steel.—Some local mill representatives intimate books for the third and last quarter may be opened within a few days, but going business is confined to regular customers in urgent need of raw material. Railroad embargoes have further reduced New England stocks of finished iron and steel, especially of ½-in. bars and all sizes of cold-rolled stock. One mill that accepted bar business at 3c. f.o.b. Pittsburgh is now asking 3.25c. and 3.50c., and another independent is asking 4c. Fancy prices obtain for small tonnages of cold-rolled stock, a broker selling ten tons ¼-in. to 7/16-in. at $12 f.o.b. Boston. A Springfield, Mass., firm is in the market for 1220 tons forging steel bars, for which it has offered 3.75c. f.o.b. Pittsburgh, or with the forged steel extra of $5, a 4c. base. The price range on blue annealed sheets is 3.55c. to better than 4.55c. f.o.b. Pittsburgh, and on galvanized 5.70c. to 6.75c. As high as 6½c., f.o.b. Pittsburgh, has been offered here for No. 11 gage galvanized blister sheets, and 4½c. to 5c. for blue annealed. Consumers find it increasingly difficult to place plate tonnages. Small tonnages have been accepted at less than 4c., f.o.b. Pittsburgh, but most bookings are at that price or higher. The Beacon Oil Co., Boston, wants 300 tons of plates, nearby shipment. The structural market is quiet and firm. Two hundred and ten tons for General Electric Co., Pittsfield, Mass., buildings was let to Levering & Garrigues Co., Boston. Two 100-ton Wakefield, Mass., jobs will be let soon.

Pipe.—Local jobbers of iron and steel pipe are carrying unusually small stocks, although well covered by mills. One of the largest jobbing houses has not received a car-lot shipment since the last of January. The cast iron pipe supply situation is not as acute as the iron and steel pipe, but is far below normal for this season. Prices on all kinds of pipe are firm and unchanged.

Warehouse Business.—Some local warehouses say that irrespective of what action the mills may take in the matter of prices, quotations here will have to be advanced sooner or later because iron and steel has been bought on a 4c. f.o.b. Pittsburgh base, which, when freights and overhead expenses are added, allow no profit at 5c., the present market. Small cold-rolled bars are reported as having sold from store at 6c. and 6½c. The wire and cut nail supply situation appears a shade easier, but it can be greatly improved. Local stocks of plates, sheets and small angles are badly broken.

Jobbers quote: Soft steel bars, $5 base per 100 lb.; flats, $5.50 to $5.85; concrete bars, $5 to $5.50; tire steel, $6 to $6.50; spring steel, open hearth, $10; crucible, $15; steel bands, $6.75; steel hoops, $7.75; toe calk steel, $6.75; cold rolled steel, $6.50 to $7; structural, $5; plates, $5.50; No. 10 blue annealed sheets, $6.55; No. 28 black sheets, $8.55; No. 28 galvanized sheets, $10; refined iron, $5 base; best refined, $6.50; Wayne, $7.50; band iron, $6.75; hoop iron, $7.75; Norway iron, $20.

Old Material.—The past week has witnessed a sharp contraction in purchases of old material, and while yard prices are practically on last week's basis, the market unquestionably is weaker. Pennsylvania interests are still buying pipe in a limited way, but will not pay more than $21.50. Outside buying is conspicuous by its absence. Some of the smaller New England foundries, not able to get pig iron, are buying small tonnages of machinery cast, but the larger ones apparently have all they require for the rest of the month, at least. The railroad embargo situation has further complicated matters, so the old material market is fast drifting toward a nominal condition. Prices as quoted at the yards follow:

No. 1 heavy melting steel	$20.00 to $21.00
No. 1 railroad wrought	29.50 to 30.50
No. 1 yard wrought	25.00 to 26.00
Wrought pipe (1 in. in diameter, over 2 ft. long)	21.00 to 21.50
Machine-shop turnings	15.50 to 16.00
Cast iron borings	18.00 to 19.00
Heavy axle turnings	17.50 to 18.50
Blast furnace borings and turnings	15.00 to 15.50
Forged scrap	16.00 to 16.50
Bundled skeleton	16.50 to 17.00
Street car axles	31.00 to 32.00
Car wheels	37.50 to 38.50
Machinery cast	39.00 to 40.00
No. 2 cast	36.00 to 37.00
Stove plate	30.00 to 31.00
Railroad malleable	28.00 to 29.00
Rerolling rails	29.00 to 30.00

Cincinnati

CINCINNATI, April 13.

Pig Iron.—The market is more active than for some time past, and during the week a fair tonnage of iron was sold to melters in this territory. Most of this iron was in lots of from 500 tons downward, and for shipment during the second quarter. One interest during the week reported sales aggregating 6000 tons. There is considerable inquiry for small tonnages of foundry iron for prompt shipment, but little interest is being shown by melters in last half requirements, they apparently being satisfied to wait a little longer before covering. Little Northern iron is offered in this territory, as most furnaces are reported to be practically sold up for the rest of the year. In southern Ohio, one producer is reported to be completely out of the

market, while another has about one month's output yet to dispose of. A third, reported sold up for the first half, is now out of the market, and it is reported that when it again opens its books its price will be from $3 to $5 a ton over those prevailing to-day. The fact that very little Northern iron is available for first half has resulted in melters turning their attention to the South, and most of the business done is in Southern and Virginian irons. Southern iron at $40 has disappeared and the market is now at $42 for the base grade, with $43 being quoted in some cases for last half. We note a sale of 1000 tons of Southern No. 2 foundry to an Indiana melter for last half shipment at $42. A Cincinnati melter took 350 tons of Southern foundry, silicon 2.25 to 2.75, at $43.25, furnace, for prompt shipment, and a number of sales of 200 to 300 tons of the same silicon content are noted at the same price. A sale of 1000 tons of Virginia iron for last half shipment to a melter in this territory was made last week at $43, furnace, while another of 500 tons is reported at $42, furnace. Malleable iron shows a weaker tendency and further sales from southern Ohio furnaces are reported at $43. Considerable interest is being shown in silveries, and prices are holding firm at the recent levels. Several inquiries are before the market for basic iron, but no orders have been placed, as buyers consider the price quoted too high. The Bon Air Coal & Iron Corporation has blown in its Standard furnace at Goodrich, Tenn., which will produce about 60 tons of warm blast charcoal iron daily.

Based on freight rates of $3.60 from Birmingham and $1.80 from Ironton, we quote f.o.b. Cincinnati:

Southern coke, sil. 1.75 to 2.25 (base price)	$45.60
Southern coke, sil. 2.25 to 2.75 (No. 2 soft)	46.85
Ohio silvery, 8 per cent sil	56.80
Southern Ohio coke, sil. 1.75 to 2.25 (No. 2)	44.80 to 46.80
Basic Northern	41.80
Malleable	44.80 to 45.80

Coke.—Contracts for Connellsville coke are being renewed at $10, ovens, for foundry, with new customers, and old customers wishing more than their first half allotment are being quoted $12. New River coke for prompt shipment only is quoted at $13 to $13.50 and Wise County at $11 to $12. The shortage of coke is still acute locally, and should shipments be held up by the railroad strike, many foundries in this district will be faced with a serious situation, as they have only a very limited supply on hand.

Finished Material.—Demand for iron and steel products of all kinds shows no signs of letting up, and local sales offices are swamped with inquiries from all over the country. Sheets continue to be in heavy demand, and mills in this territory are unable to take care of anything near the tonnages offered. The anouncement that the American Sheet & Tin Plate Co. will open its books for last half business on April 13 has been followed by a flood of inquiries to the local offices of independent mills as to whether they will follow the lead set by the American company. It is stated authoritatively that mills in this territory will not open books for last half business until May 1. An inquiry from a railroad for 4300 tons of 100-lb. rail has been received by the local office of one of the larger steel companies, but it is understood that the company will not quote on it, as the capacity of its mills has been booked for the remainder of the year. An inquiry for 1000 tons of galvanized sheets is understood to have brought a quotation of 8½c from a mill in southern Ohio. Warehouses report deliveries as improving, but that with the big demand they are unable to add to their stocks. A local jobber reports that he has been offered a big tonnage of blue annealed sheets for immediate delivery at 6.25c. Pittsburgh mill jobbers are quoting on stock out of warehouse.

Tool Steel.—Business is fairly good in tool steel, though the prospects of a strike of machinists on May 1 is having some effect on buying. Reports of price cutting do not seem to be well founded, and quotations on high speed steel remain at $1.25 to $1.30 per lb.

Iron and steel bars, 5c. to 6c.; structural shapes, 5.10c.; plates, 5c.; steel bands, 6.25c. base; No. 10 blue annealed, 7c.; No. 28 black sheets, 7.75c. to 8.75c.; No. 28 galvanized sheets, 9c. to 10c.

Old Material.—The scrap market is quiet, with a softer tendency. This is ascribed by local dealers to the railroad strike preventing shipments to steel producing centers. Prices remain unchanged from last week, though it is altogether likely that offers of from 50c. to $1 a ton lower would meet with favorable response from dealers. Car shortage and scarcity of labor to load scrap are reported locally, and dealers expect that when conditions become more normal this will have the effect of making prices go higher.

We quote as follows:

Per Gross Ton	
Bundled sheet	$16.00 to $17.00
Old iron rails	27.00 to 28.00
Relaying rails, 50 lb. and up	50.00 to 51.00
Reroiling steel rails	30.00 to 31.00
Heavy melting steel	21.50 to 22.50
Steel rails for melting	24.00 to 25.00
Car wheels	29.00 to 30.00
Per Net Ton	
No. 1 railroad wrought	$26.00 to $27.00
Cast borings	13.50 to 14.00
Steel turnings	11.50 to 12.00
Railroad cast	31.00 to 32.00
No. 1 machinery	35.00 to 36.00
Burnt scrap	22.00 to 23.00
Iron axles	29.50 to 30.00
Locomotive tire (smooth inside)	23.50 to 24.50
Pipes and flues	17.00 to 17.50
Malleable cast	23.00 to 23.50
Railroad tank and sheet	16.00 to 16.50

New York

NEW YORK, April 13.

Pig Iron.—In spite of the many difficulties in manufacturing and shipping pig iron, a distinctly optimistic sentiment prevails in the trade. Sales of the past week have made a very fair volume and have included several thousand tons of basic at $43, furnace, 5000 tons of forge for last half delivery at a price not stated, and 3000 tons of charcoal, in addition to several lots ranging from 800 to 1000 tons for shipment into New England. In eastern Pennsylvania $45 furnace seems to be the lowest quotation on base iron, 1.75 to 2.25 silicon, while on Virginia iron $43.25 is the lowest quotation and at Buffalo it is difficult to shade $44, furnace, except on iron in the hands of brokers, including one lot which ranges from 1.25 to 2.50 silicon and 0.06 sulphur. On this lot, which seems to be going begging, the very low price of $40.50, furnace, has been made. Reports from New England are to the effect that melt is very heavy, with the prospect that it will so continue unless the railroad strike prevents. We note a sale of 1500 tons additional of foundry iron for export to Great Britain. This follows the recently reported sale of 2000 tons for that country. Very little iron of any kind is available for first half, most sales of any size being made now for the last half.

We quote for delivery in New York as follows:

East. Pa., sil. 2.75 to 3.25	$49.05
East. Pa., sil. 2.25 to 2.75	48.05
East. Pa., No. 2 plain, sil. 1.75 to 2.25	46.80
Buffalo, sil. 1.75 to 2.25	$47.90 to 48.90
No. 2 X Virginia, sil. 2.25 to 2.75	47.65

Ferroalloys.—The ferromanganese market is quiet but very strong. There is a perceptible increase in demand for prompt and early delivery, at which sales of limited amounts of both British and American ferromanganese have sold at $225 to $250, delivered. There have also been sales of the American product at $200, delivered, for the last half, which is the prevailing quotation. There is a limited amount of British alloy available for delivery from August on at $195, seaboard. Production of ferromanganese by American producers in March, according to the blast furnace reports by THE IRON AGE, was 19,803 gross tons, which compares with 18,062 tons and 16,283 tons in January and February, respectively. The situation in spiegeleisen is mixed. A leading producer is asking $64, furnace, and another is asking as high as $75, furnace, but it is stated that sales have been made to one or two domestic consumers as low as $58, furnace; it is believed that the latter is resale material. Production of spiegeleisen in the United States in January was 15,472 tons, which is nearly three times the monthly output in all of 1919, when it was 5449 tons per month. The increase since January has been considerable, the February output having been 11,755 tons and the January output 5895 tons. High-grade

manganese ore is quoted at 80c. per unit, seaboard, for early delivery, but no sales have been heard of in the last week. Ferrosilicon, 50 per cent, is quiet but strong at $80 to $85 per ton, delivered.

Finished Iron and Steel.—A round tonnage of fabricated steel work and a continued demand in the export field stand in contrast with the virtual cessation of mill shipments because of the rebellion within railroad labor organizations. The total of bridge and building work put under contract in this section in large-sized projects for the week is about 15,000 tons and between 15,000 and 20,000 tons are expected soon to be awarded for projects not as yet identified. No new railroad car settlements have been learned of, but the Bethlehem Steel Co. is inquiring for 500 hopper cars of 70 tons capacity, though not engaging apparently to supply the steel itself. In rails, no additional large lot is expected to be bought for 1920. It is estimated that fully 100,000 tons were bought at the $57 price. Large transactions in bars, shapes and plates were for export, as noted elsewhere. So urgent is England for ship material that premiums are offered for relatively early shipment. For automobile forgings 5000 tons for delivery over four months is noted at 4.25c., Pittsburgh base; the buyer is desirous of covering for at least 2000 tons monthly over two years. A small tonnage of boiler plates for May and June delivery has been sold on a Pittsburgh base of 4.50c. A few hundred tons of ordinary steel bars have been sold at 4.50c. by a mill which has been selling below 4c. and another indication of the anomalous situation is indicated in the sale of 2000 tons of high carbon steel bars at 5.25c. The structural awards include the following: 3500 tons to the Hedden Iron Construction Co. for an office building for the Barrett Co., West and Rector streets; 1750 tons to the Standard Boiler Works for tanks for the New Orleans Refining Co. at Good Hope, La.; 950 tons to the Levering & Garrigues Co. for the American Brake Shoe & Foundry Co., Newark, N. J.; 6700 tons to the American Bridge Co. for the American Telephone & Telegraph Co., Broadway and Fulton Street; 1250 tons to the McClintic-Marshall Co. for the Gilbert & Barker Mfg. Co., West Springfield, Mass.; 230 tons to Dietrich Brothers for an industrial savings bank and 350 tons to the Bethlehem Steel Bridge Corporation for a bridge at Deal Beach, Asbury Park, N. J. Smith, Hauser & MacIsaac have the contract for piers 12 and 13 at Stapleton, S. I., but the pier sheds taking a round tonnage of steel have not yet been contracted for. Other fresh projects include 1500 tons for the Ventnor Hotel, Atlantic City; 270 tons for the Baltimore & Ohio at Guysville, Ohio; 600 tons for the General Electric Co. at Lynn, Mass.; 300 tons for the Selznick Corporation at Long Island City; 1000 tons for a plant at Pawtucket, R. I.; 4000 tons for an apartment hotel, Park Avenue and Forty-eighth Street, and 400 tons for tanks for the American Locomotive Co.

We quote for mill shipment, New York, as follows: Soft steel bars, 2.62c. to 4.77c.; shapes, 2.72c. to 4.27c.; plates, 2.92c. to 4.77c., the minimum prices being for indefinite delivery and the higher prices for the second quarter; bar iron, flats, wider than 6 in., 4.57c.; ⅝ and 7/16 in., round and square, 5.27c.; light rounds, squares and flats, 5.77c., and other sizes, 4.27c.

Warehouse Business.—With the depleted stocks and difficulty in obtaining material that warehouses have been encountering for some time, the railroad strike situation only adds to the pessimistic outlook. Some warehouses have received a few carloads of material shipped from the mills before the embargo. An increase has been made in quotations on bars, shapes and angles by most warehouses and a number have also increased prices on blue annealed, black and galvanized sheets. An increase in mill prices on toe calk steel has caused an advance by warehouses from 5.50c. per lb., New York, to 5.75c. per lb. and 6c. Conditions in the brass and copper warehouses remain the same, several more mills having closed down. Prices quoted are nominal. We quote prices on page 1154.

High Speed Steel.—The market shows a slight weakness, probably caused by sales of imported high speed steel. Producers continue to quote from $1.25 per lb. to $1.30 per lb., New York. Many consumers show a preference for the domestic product at a higher price, doubting the ability of foreign sellers to assure prompt and continued delivery of all sizes.

Cast Iron Pipe.—Only the low exchange prevents a large export business, as is indicated by the many inquiries and "feelers" received by manufacturers. Labor becomes an ever-increasing problem because of its scarcity, as instanced by a pipe-making consumer of pig iron who has ordered all iron delivered in small pigs because of a lack of men to break them. The embargoes caused by the railroad strike are also hindering this line of manufacture. The city of Buffalo will open bids for 1000 tons on April 17; Asbury Park opened bids for 100 tons April 13. We quote 6-in. and heavier at $72.30, New York; 4-in., $75.30, with $2 additional for Class A and gas pipe.

Old Material.—Last week was one of the most quiet in many months, due chiefly to railroad embargoes. Several items are off about $1 over a week ago. A New York broker is paying $2.50 less than 10 days ago, for both grate bars and stove plate. Prices secured on cast scrap are very irregular. No. 1 machinery cast scrap was sold, delivered, to a Brooklyn foundry, for $45 recently, though this was considerably above the market price. Among the items which have dropped in price are forge fire, yard wrought, clean borings and pipe.

Buying prices per gross ton, New York, follow:

Heavy melting steel	$20.00 to $21.00
Rerolling rails	31.00 to 32.00
Relaying rails, nominal	48.00 to 50.00
Steel car axles	34.00 to 35.00
Iron car axles	43.50 to 44.00
No. 1 railroad wrought	33.00 to 34.00
Wrought iron track	22.50 to 23.00
Forge fire	16.00 to 17.00
No. 1 yard wrought, long	25.00 to 26.00
Light iron	10.00 to 11.00
Cast borings (clean)	18.00 to 18.50
Machine-shop turnings	16.00 to 16.50
Mixed borings and turnings	15.00 to 15.50
Iron and steel pipe (1 in. min. diam., not under 2 ft. long)	21.50 to 22.00
Stove plate	28.50 to 29.00
Locomotive grate bars	27.50 to 28.00
Malleable cast (railroad)	28.50 to 29.00
Old car wheels	38.00 to 38.50

Prices which dealers in New York and Brooklyn are quoting to local foundries, per gross ton:

No. 1 machinery cast	$39.00 to $40.00
No. 1 heavy cast (columns, building materials, etc.), cupola size	38.00 to 39.00
No. 1 heavy cast, not cupola size	30.00 to 31.00
No. 2 cast (radiators, cast boilers, etc.)	32.00 to 33.00

St. Louis

ST. LOUIS, April 13.

Pig Iron.—Considerable selling in lots ranging down from 1000 tons has been done during the past week, the total probably running to 10,000 tons for the St. Louis district. The price has shown no change save that the Tennessee company offered iron at $38 Birmingham and closed a few contracts. Other furnace representatives maintained their former figures. Embargoes due to the rump switchmen's strike have caused hesitancy in some respects, but plants generally are supplied with material and fuel and still operating against the time when they will be able to resume shipment of finished products.

Coke.—Coke contracts made during the past week for future delivery have aggregated about 5000 tons on a basis of $12, Connellsville, but on immediate shipment business no transactions are reported due to the railroad strike and its embargo on transportation.

Finished Material.—Conditions in finished iron and steel remain unchanged from last reports except that receipts have been interfered with by the strike and no orders are being accepted except for deferred deliveries, and these in rather limited fashion because of the indisposition of mills to commit themselves definitely in any great degree. Warehouse men have been pressed still harder for material as a result of the railroad

strike, and movement is limited because of non-receipt of further supplies.

For stock out of warehouse we quote as follows: Soft steel bars, 3.94c.; iron bars, 4.59c.; structural material, 4.04c.; tank plates, 4.24c.; No. 10 blue annealed sheets, 5.59c.; No. 28 black sheets, cold rolled, one pass, 7.60c.; No. 28 galvanized sheets black sheet gage, 9.10c.

Old Material.—The scrap market is in a waiting condition because of the strike, which is interfering seriously with handling of material. Prices made are largely nominal because there are practically no transactions to establish figures. Railroad lists out went at only fair prices, including 2150 tons from the Wabash, 700 tons from the Missouri, Kansas & Texas. Operations of industries are difficult, the Kelmbacher Rolling Mills being closed down for lack of fuel and the Granite City Steel Works being under embargo because of the strike conditions. The rolling mills of the St. Louis Screw Co. are operating fully, as the fuel supply there is adequate and work is being pushed through against the time when shipments can be resumed.

We quote dealers' prices, f.o.b. customers' works, St. Louis industrial district, as follows:

Per Gross Ton	
Old iron rails	$32.50 to $33.00
Old steel rails, rerolling	31.50 to 32.00
Old steel rails, less than 3 ft	26.00 to 26.50
Relaying rails, standard sections, subject to inspection	50.00 to 55.00
Old car wheels	34.50 to 35.00
No. 1 railroad heavy melting steel	22.50 to 23.00
Heavy shoveling steel	21.50 to 22.00
Ordinary shoveling steel	21.00 to 21.50
Frogs, switches and guards, cut apart	24.00 to 24.50
Ordinary bundled sheets	14.50 to 15.00
Per Net Ton	
Heavy axle and tire turnings	16.00 to 16.50
Iron angle bars	29.50 to 30.00
Steel angle bars	22.00 to 22.50
Iron car axles	39.50 to 40.00
Steel car axles	33.50 to 34.00
Wrought arch bars and transoms	31.00 to 31.50
No. 1 railroad wrought	25.50 to 26.00
No. 2 railroad wrought	23.50 to 24.00
Railroad springs	22.50 to 23.00
Steel couplers and knuckles	24.00 to 24.50
Locomotive tires, 42 in. and over, smooth inside	22.50 to 23.00
No. 1 dealers' forge	22.00 to 22.50
Cast iron borings	14.00 to 14.50
No. 1 busheling	21.50 to 22.00
No. 1 boiler, cut to sheets and rings	17.00 to 17.50
No. 1 railroad cast	35.00 to 35.50
Stove plate and light cast	30.50 to 31.00
Railroad malleable	26.00 to 26.50
Agricultural malleable	25.50 to 26.00
Pipes and flues	17.00 to 17.50
Heavy railroad sheet and tank	16.50 to 17.00
Railroad grate bars	27.50 to 28.00
Machine-shop turnings	13.50 to 14.00
Country mixed	19.00 to 19.50
Uncut railroad mixed	19.50 to 20.00
Horseshoes	24.50 to 25.00

Philadelphia

PHILADELPHIA, April 13.

Embargoes put into effect by Eastern railroads, as a result of the unauthorized strike of workers, have practically cut off all shipments of steel products, pig iron and scrap in this territory. Incoming coal and coke shipments are also reduced to a minimum. If present conditions continue on the railroads for a few more days, it is probable that every steel plant in the East will be wholly or partially shut down and a great many of the blast furnaces will be banked. Conditions are much worse, in some respects, than existed at any time during the steel strike of last fall, which barely touched the Eastern steel companies. One steel plant, for example, is so embargoed that it can ship to only one of its many customers.

The Bethlehem Steel Co. was operating its steel-making and finishing departments to-day (Tuesday), but it was expected that shut-downs would result before the end of the week. The same is true of the Johnstown and Coatesville plants of the Midvale Steel & Ordnance Co. The Lukens Steel Co. on Tuesday had only one mill operating. The Eastern Steel Co. shut down its finishing department Monday night and was on the verge of stopping the melting of steel. The Central Iron & Steel Co. at Harrisburg is seriously affected and may shut down at any time. The Alan Wood, Iron & Steel Co. to-day had two of its blast furnaces banked; its blooming mill was operating to-day, but finishing mills were operating only intermittently. The Eastern Steel Co. has banked its Warwick furnaces. Other blast furnaces either banked or on the verge of being banked at this writing are Brooke, Robesonia and Oxford. Nearly all of the Eastern furnaces are short of coke and before the end of the week a considerable number may be banked. Similar conditions affect the Virginia furnaces, but as some of them are independent as to coke supply, they may continue to operate. However, pig iron shipments from Virginia furnaces are also under embargo.

Under these conditions no one is anxious to take business, and in fact comparatively little has been offered since the railroad situation became so serious. Nearly all of the steel companies have adopted a waiting attitude, informing customers who inquire that until they know the outcome of the railroad strike they would prefer not to quote. Scrap shipments are, of course, also held up and prices of nearly all grades have weakened.

Pig Iron.—The troubles due to the railroad situation are affecting many furnaces. Business has been rather quiet in the past few days, but prior to the strike's worst phases, a considerable tonnage had been booked by Eastern furnaces. A New England consumer bought 3000 tons of basic in this district at $43, furnace. There were also a number of sales of foundry iron for second half, including 2000 tons or more to the Westinghouse Electric & Mfg. Co. Gray forge iron is in demand and business may be closed soon. Several small lots of copper free low phosphorus iron were sold at $50, furnace, for second half. A local pig iron dealer has sold several thousand tons of off-grade foundry iron at $40.50, Buffalo furnace, this iron being mixed lots which analyzed 1.00 to 2.50 per cent silicon and about 0.06 sulphur. Standard foundry iron, however, is still firm at $45, furnace, for No. 2 plain, with usual differentials added for higher silicon. Most of the eastern Pennsylvania furnaces are now quoting on this basis. One Virginia furnace has advanced its base price from $42.25 to $43.25, furnace, and another has advanced from $43 to $44, furnace. No sales have been made at the $44 price, however.

The following quotations are for iron delivered in consumers' yards in Philadelphia or vicinity, except those for low phosphorus iron, which are f.o.b. furnace:

East. Pa., No. 2 X, 2.25 to 2.75 sil.	$47.05 to $47.35
East. Pa., No. 2 plain, 1.75 to 2.25 sil.	45.80 to 46.10
Virginia No. 2 plain, 1.75 to 2.25 sil.	47.10
Virginia No. 2 X, 2.25 to 2.75 sil.	48.35
Basic deliv. Eastern Pa.	44.80
Gray forge	43.00 to 44.00
Standard low phos. (f.o.b. furnace)	50.00
Malleable	46.75
Copper bearing low phos. (f.o.b. furnace)	47.00

Ferroalloys.—Ferromanganese has been sold again at $250 per ton for April shipment. Sales have also been made for May-June shipment at $230, and some for last half at $200, delivered.

Semi-Finished Steel.—Little has been done in the past few days, but last week sales of rerolling billets were made at $65, Pittsburgh. Steel companies report that they could get $80 or $90 per ton, Pittsburgh, for forging billets, if they had any to sell for nearby delivery.

Plates.—During the past week, there has been an unusual rush of specifications on first quarter contracts. One plate company reports that buyers, almost without exception, took out their first quarter contracts in full. Operating conditions have been affected by the railroad embargoes. All or nearly all of the Eastern plate mills will be idle before the end of the week unless the railroad situation improves. Further railroad inquiry is before the market, including an inquiry from the Baltimore & Ohio for 5000 to 10,000 tons of plates, shapes and bars for delivery at mill convenience over the remainder of the year. The Pennsylvania Railroad is considering quotations on 4000 to 8000 tons of plates, shapes and bars. A Delaware River shipbuilding interest has issued a tentative inquiry for 8000 to 16,000 tons of plates for tankers, delivery in the last four months of the year. The plate market continues strong, and with the exception of the 2.65c. price quoted by

the leading interest and a price of 3.75c. quoted by one independent, the market is firm at 4c., Pittsburgh. Practically any business on which deliveries are required in the first half cannot be closed at less than 4c.

Structural Material.—Eastern shape mills are affected by the rail situation and as a general rule are not selling. A Chicago jobber has been trying to place an order for 5000 tons of shapes at 3.25c., Pittsburgh, but apparently no Eastern mill is interested in the business at this price. New structural projects in this district are not numerous. One before the trade is for 2000 tons or more of shapes for an Atlantic City hotel.

Bars.—The demand for bars still continues very heavy. Latest reported sales are at 4.75c., base, by one company and at 4c., base, Pittsburgh, by another company. Small bars are extremely scarce.

Sheets.—An Eastern mill is making sales of small lots of blue annealed sheets on the basis of 5.25 to 5.50c., Pittsburgh, for No. 10 gage.

Bolts.—One of the leading Eastern makers of bolts has announced new prices on machine and carriage bolts. Rolled thread bolts are advanced about 10 per cent, the new discount being 40 and 5 per cent off list, while on small bolts with cut threads the discounts are now the same as on large bolts, cut threads. All bolts, regardless of size, with cut threads, are 30 and 10 per cent off list. For less than 100 bolts of a size there are new extras. For lots of 25 to 99 of one size the extra charged by this maker is 5 per cent; for lots of from 10 to 24 the extra is 10 per cent, and on less than 10 of a size a special price is made in each instance.

Spikes.—An Eastern maker of spikes has advanced railroad spikes, ½ in. and larger, to 4.25c., base; 7/16 in. and ⅜ in., to 5.50c., base, in lots of 200 kegs or more. Boat spikes are advanced to 6c., base, for small lots and to 5.50c., base, for 25 kegs or more.

Old Material.—The scrap market is weak, with prices on many grades 50c. or $1 a ton lower. The lower prices have been established mostly on transactions among dealers, as consumers are not buying. The railroad tie-up has seriously affected the scrap trade, as it has other lines. We quote for delivery at consumers' works in eastern Pennsylvania as follows:

No. 1 heavy melting steel	$24.00 to $24.50
Steel rails rerolling	32.00 to 33.00
No. 1 low phos., heavy 0.04 and under	30.00 to 31.00
Car wheels	40.00 to 41.00
No. 1 railroad wrought	35.00 to 36.00
No. 1 yard wrought	29.00 to 30.00
No. 1 forge fire	19.50 to 20.00
Bundled skeleton	19.50 to 20.00
No. 1 busheling	24.00 to 25.00
No. 2 busheling	18.50 to 19.50
Turnings (short shoveling grade for blast furnace use)	18.00 to 19.00
Mixed borings and turnings (for blast furnace use)	17.50 to 18.00
Machine-shop turnings (for rolling mill and steel works use)	19.00 to 19.50
Heavy axle turnings (or equivalent)	20.00 to 21.00
Cast borings (for rolling mills)	20.00 to 21.00
Cast borings (for chemical plant)	24.00 to 25.00
No. 1 cast	38.00 to 40.00
Railroad grate bars	30.00 to 31.00
Stove plate	29.00 to 30.00
Railroad malleable	30.00 to 31.00
Wrought iron and soft steel pipes and tubes (new specifications)	24.50 to 25.00
Iron car axles	45.00 to 46.00
Steel car axles	42.00 to 44.00

San Francisco

SAN FRANCISCO, April 6.

Labor conditions show no change this week, although various rumors indicate that an earnest effort is being made to bring about an end of the strike conditions which have existed in the shipyards since Oct. 1 of last year. The moulders continue to support the strikers and refuse to handle castings ordered by shops run on the open shop basis. This is causing more or less friction among the foundries, but the situation is not regarded as acute.

Bars, Shapes and Sheets.—The demand for bars continues very brisk, especially for the export trade. Prices are still quoted at 4.50c to 4.65c, but it is impossible to get deliveries at these prices, and bars needed for immediate use are held at a premium, which in some cases has brought the selling price as high as 5.30c or $106 per net ton. The high cost of building materials and the excessive wages in the building trades are keeping back the building of large structures in this city and elsewhere on the Coast. About nine-tenths of the buildings planned are postponed. Plates are comparatively easy, but sheets, especially galvanized, are in greater demand than the local supply, according to jobbers. The latter complain of shortage of all materials but that the most serious shortage is in sheets. Galvanized sheets have advanced 50 cents and now sell at $10 from stock for the No. 28 base, l.c.l.

Pig Iron.—No. 3 foundry pig delivered at consuming furnaces is selling at $61 in this territory. For the present the Scotch pig is out of the local market on account of the shifting exchange rate. As the pound sterling increases in value the price of Scotch pig is expected to go down, but as no reduction has as yet been announced, buyers are holding off.

Old Materials.—Scrap in general is showing no improvement, but the price of steel scrap has taken a sudden jump. One of the largest dealers in steel scrap in this city has just announced a price for the next 30 days of $30 per net ton delivered at the furnace. This dealer also states that if steel bars continue to sell at their present high price, steel scrap will be raised to $35 per net ton for May shipments. The position of this dealer is so strong, in so far as the producers of steel scrap on the Coast is concerned, that there appears little doubt that he can enforce the prices he demands.

British Price Tendency Higher

German Steel Exports Prohibited—Scarcity of Coke—Tin Plate Wages Again Increased

(By Cable)

LONDON, ENGLAND, April 13.

The pig-iron market is unchanged. Export inquiry is persistent and makers are generally not quoting, this policy being reflected in the March shipments, which fell 7000 tons. Small supplies are expected to be available for export next month. The position in hematite is tight and makers are fully booked until May, but export business is impossible owing to clauses covering advances included in contracts. The demand for home consumption is heavy. Scotch hematite has advanced 10s., with the minimum quotation at £13.

The foreign ore market is quiet and a little easier, with 34s. 6d. fixed for shipments from Castro.

Coke is scarce and prices are strong, with good medium grades held at 55s. 6d.

The steel position is unaltered and makers are generally not quoting. Orders for a large lot of plates have been placed for India. Scottish prices have advanced, plates being quoted 20s. higher and beams 9s. The tin-plate market is firmer and more inquiry from the Continent has appeared, being quoted for early delivery at 78s., basis, with May-June shipment at 75s. to 76s. and July-September delivery at 73s., all f.o.t. There is a good demand for wasters.

Wages for tin-plate workers, which were increased 40 per cent in January, are now increased to 50 per cent from April 3 for three months, with all other claims withdrawn.

The galvanized sheet market is strong, with up to £60 f.o.b. quoted for No. 24-gage corrugateds, for prompt delivery, but July delivery is obtainable at £56. There is a strong demand for black sheets, and sheets made to Calcutta specifications have sold for £48 f.o.b. For Japanese specifications £70 f.o.b. has been quoted.

The German government has prohibited all exports of steel.

We quote per gross ton, except when otherwise stated, f.o.b. maker's works, with American equivalent figured at $3.96 for £1, as follows:

	£	s.	£	s.	
Ship plates	25	0 to	30	0	$99.00 to $118.80
Boiler plates	28	10 to	33	0	112.86 to 130.68
Tees	25	10 to	32	0	100.98 to 126.72
Channels	24	15 to	31	5	98.01 to 124.74
Beams	24	10 to	30	0	97.02 to 118.80
Round bars, ¾ to 3 in.	27	0 to	32	10	106.92 to 128.70
Rails, 60 lb. and up	21	0 to	22	0	83.16 to 87.12
Billets	24	10 to	25	10	97.02 to 100.98
Sheet and tin plate bars, Welsh	31	0 to	35	0	122.76 to 138.60
Galvanized sheets, 24 g.	56	0 to	60	0	221.76 to 237.60
Tin plate, base box	3	13 to	3	18	14.47 to 15.44
Steel hoops	34	15 to	35	0	137.61 to 138.60
Cleveland basic iron	10	10			41.58
West Coast hematite	13	5			52.47
Cleveland No. 3 foundry (export to allies)	10	5			40.59
Ferromanganese	35	0 to	40	0	138.60 to 158.40
Coke	2	15½			11.00

Continued Stringency in Raw Materials—Orders in Excess of Production—Exports Curtailed

LONDON, England, March 29.—The position continues to be one of continued stringency everywhere, of demands in excess of supplies with orders being constantly turned down. The labor outlook recently has been clouded, particularly in the coal mining industry and the railroads. Some trouble was threatened in regard to the latter but it appears to have been averted. The coal position is still uncertain but the outlook is distinctly brighter.

There seems to be little hope of an increased production of pig iron in the near future. The demand is far in excess of production, but the continued scarcity of fuel prevents producers from increasing the number of furnaces in operation. Although there is a splendid export inquiry which it would be much to the country's benefit to take advantage of, the quantities going to overseas markets have been ruthlessly cut down so that urgent home requirements may be met. Even then the supplies for consumers in this country are inadequate. Of course the transport situation further aggravates the position. Prices of No. 1 Cleveland are 212s. 6d. and No. 3 G. M. B. 200s. with 5s. more for France, Belgium and Italy. If iron were available for other countries the price would probably be somewhere about 230s. to 240s. f.o.b.

In finished iron and steel an important factor continues to be the railroad congestion causing a shortage of raw materials. Consumers everywhere are clamoring for supplies. Large inquiries have had to be partially turned down and makers show more and more disinclination to quote as they are unable to obtain their full output. Prices steadily tend upward. Some good inquiries have recently been reported from the export markets, Japan being anxious for shipyard material. Little business, however, seems to have resulted.

It is reported that the directors of Dorman, Long & Co. propose to ask the shareholders' sanction for a further increase in the capital to cover the extension of the undertaking, and meet requirements for working capital owing to the continued expansion of the business. It is understood that it is proposed to create 3,000,000 ordinary shares of £1 each. It is also reported that the Powell Duffryn Steam Coal Co.'s offer to the Rhymney Iron Co.'s shareholders to acquire their holdings has been accepted by 97 per cent of the Rhymney company's shareholders.

It now appears that Armstrong, Whitworth & Co., Ltd., are preparing to add civil engineering and public works contracting on a large scale to their already extensive enterprise. The firm's recent amalgamation places them in an excellent position for undertaking big contracts of this nature. In addition to the great resources of their works at Elswick and Openshaw they have also the assistance of Armstrongs & Main for constructional work, and Messrs. Crompton for electrical undertakings while their recent purchase of Pearson & Knowles shares places them in control of important supplies of raw materials.

IRON AND INDUSTRIAL STOCKS

Outlaw Railroad Employees' Strike Causes Some Selling of Securities

The market for iron and industrial securities has continued irregular of late, with the advantage on the down side much of the time because of selling based on the strike of outlaw railroad employees, which is having a far-reaching influence on general business. Taken as a whole, however, the market has not acted badly, due in a large measure to the iron and steel situation.

The fact that the United States Steel Corporation today has more unfilled business on its books than it has had before since August, 1917, that the other steel companies are sold far ahead and that the sale and production of pig iron this year will make a highly favorable showing, have been sustaining influences. Higher prices for copper metal have helped the market for copper shares. Offsetting these factors have been the uncertainty regarding the Commerce Commission's basis of railroad valuation and another rise in money rates following a temporary reaction. Then, too, the foreign exchange situation has been helped but little by recent importations of gold from England.

The range of prices on active iron and industrial stocks from Tuesday of last week to Wednesday of this week was as follows:

Allis-Chalm. com.	42¼ - 46⅜	Lake Sup. Corp.	18¼ - 19½
Am. Can com.	47¼ - 51	Midvale Steel	46¾ - 49¼
Am. Can pf.	97 - 97¾	Nat.-Acme	37½ - 37⅝
Am. Cr. & F. cm.	141½ - 147¾	Nat. E. & St. cm.	77½ - 80⅝
Am. Loco. com.	104½ - 109¼	N. Y. Air Brake	107 - 112
Am. Loco. pf.	— - 103	Nova Scotia Stl.	65 - 69¾
Am. Stl. Fdr. com.	46⅛ - 48½	Pittsbgh. Stl. pf.	90¼ - 91
Am. Stl. Fdr. pf.	— - 91	Pressed Stl. com.	103 - 113⅞
Bald. Loco. com.	138⅛ - 148	Pressed Stl. pf.	102 - 106½
Bald. Loco. pf.	— - 101½	Ry. Stl. Spg. com.	99¾ - 104
Beth. Stl. com.	92⅛ - 96	Replogle Steel	47½ - 62¾
Beth. Stl. Cl. B.	96¼ - 101⅝	Republic, com.	109¼ - 116½
Beth. Steel, 8 per cent. pf.	— - 112	Republic, pf.	98⅛ - 98¾
Chic. Pneu. Tool	103 - 111⅞	Sloss com.	74 - 80½
Colo. Fuel	38 - 41	Superior Steel	56 - 60
Cruc. Steel com.	260 - 278½	Transue-Williams	59⅞ - 65
Cruc. Steel pf.	97½ - 97¾	Un. Alloy Steel	47½ - 51¼
Gen. Electric	152 - 158	U. S. Pipe, com.	22⅛ - 24
Gt. No. Ore Cert.	37½ - 39¾	U. S. Pipe pf.	55 - 55¼
Gulf States Steel.	68 - 72½	U. S. Steel com.	104 - 107⅝
Int. Har. com.	134 - 142½	U. S. Steel pf.	111¾ - 113
Int. Har. pf.	— - 112	Vanadium Steel	71⅝ - 89¾
Lackaw. Steel	77½ - 82½	Va. I. C. & Coke	90¾ - 98½
		Westingh. Elec.	51⅝ - 53¼

Germany's Hampered Industry

WASHINGTON, April 13.—Conditions in the iron and steel industry in Germany are described by Consul Frederick Simpich, who is on duty with the American Commission at Berlin, in a report forwarded to the State Department. Mr. Simpich quotes the following from the *Industrie und Handelszeitung:*

"The situation in the iron and steel market has become even more acute on account of the coal and raw-material shortage. The after effects of the strike of the railway men is to be noticed still: many works had to close down, furnaces had to be banked, if not extinguished entirely. On the other hand, the demand for steel and iron is increasing rapidly. Within given limitations work is progressing rapidly. The industries producing small iron and steel articles have followed the larger steel works in the increase of their prices. Here, too, the demand, especially from foreign countries, exceeds the production. The shortage of metal has led to further restrictions concerning export. The machine-producing plants have also suffered greatly by the coal shortage, as have especially the forges. In consequence, orders from foreign countries have decreased, since it was known that deliveries could not be made."

About 60 men employed by the Fitzgerald Mfg. Co., Torrington, Conn., at its Winsted, Conn., plant are on strike for a nine-hour day with pay for 10 hours. The company makes automobile gaskets and a facial vibrator.

Barde Steel Corporation May Take Over More Government Steel

WASHINGTON, April 13.—Negotiations are being conducted with the Barde Steel Corporation on a deal by which it will take over the remainder of the surplus steel held by the United States Shipping Board Emergency Fleet Corporation.

The Barde company, under its original contract, is to take over during the next two years nearly $11,000,000 worth of surplus steel located at various shipyards. The steel included in this lot was purchased in connection with contracts for steel hulls. The Emergency Fleet Corporation still has on hand from one to two million dollars worth of surplus steel designed for use in connection with wood hulls. There also is some steel which might fall in either class and on which there is a question as to whether the Barde company would take it over under the original contract.

The Barde company has made an offer to take all surplus steel of all classes at a somewhat higher price than was involved in the original contract.

Under the contract of the company payments are made twice a month for the steel that is delivered. It is said by officials of the Emergency Fleet Corporation that the Barde company is selling the steel faster than it can be delivered by the Government.

Canadian Iron Ore and Coke in 1919

The preliminary report of mineral production in Canada in 1919 shows that shipments from Canadian mines last year were the smallest recorded in 19 years, amounting to only 195,970 tons. The total of iron ore charged in Canadian blast furnaces in 1919 was 1,752,585 tons, of which only 78,390 tons, or 4.4 per cent, was of Canadian origin. Of the imported ore 519,722 tons came from Wabana, New Foundland, and 1,154,473 tons from the United States.

There has been agitation in Ontario for iron ore bounties, but the Government has not been favorable. In British Columbia $3 per ton has been offered as a bounty on pig iron made from local ores, but not a great deal has come from this effort.

In 1919 some progress was made in the by-product coke industry. Six Koppers ovens were completed at Sydney, Nova Scotia, 25 Willputte ovens at Sault Ste. Marie, Ontario, and 30 Lomax ovens at Anyox, British Columbia. The imports of coke fell from 1,165,590 tons in 1918 to 383,374 tons in 1919. This decline was not altogether due to the expansion of the coke making industry in Canada, slackness in steel production being a factor. The quantity of coke-oven gas recovered in Canada in 1919 was 9340 million cu. ft., or the equivalent of one-third of the total production of natural gas in Canada.

Electrically Welded Mill Building

Details of construction of a small mill building in which all parts of the steelwork are welded with the electric arc instead of being riveted were given in the April 8 issue of *Engineering News-Record*. The structure is about 40 x 60 ft., has four roof trusses of 40-ft. span supported on 8-in. H-beam columns fitted with brackets for a 5-ton traveling crane, and is being erected for the Electric Welding Co. of America, Brooklyn, N. Y., the welding being done by this company. A considerable advantage in cost and time is claimed for the welded connections, but in the present instance the determinative feature was not cost economy so much as the fact that the fabricated work could be obtained more quickly by buying the plain steel members and cutting and welding them at the site instead of waiting for bridge shop deliveries. All material was received on the job cut to length.

When the plans for the building were submitted to the Department of Buildings, Borough of Brooklyn, the proposal to weld the connections was approved only with the stipulation of a successful load test before erection. This test was carried out March 20. Two trusses were set up at 20-ft. spacing and braced together, purlins were bolted in place, and by means of bags of gravel a load of 48 tons was applied. This was sufficient to load the trusses approximately to their elastic limit. No straining or other change was observable at the joints, and the test was considered in every respect successful. The deflection of the peak, 0.425 ft. did not change during 48 hr., and upon removal of the load at the end of that period a set of less than 0.01 ft. was measured.

Government Steel Plant in Queensland

A copy of the *Daily Mail*, published at Brisbane, Queensland, Australia, has been received by THE IRON AGE. The paper gives an account of the announcement made by the premier, Mr. Theodore, concerning the decision to build Government steel works at Bowen, Queensland. The premier will shortly visit England to raise a loan for the financing of the plant. An official statement says:

The capacity of the initial plant will be fairly considerable, as may be judged from the appended list of essential appliances to be installed:

One blast furnace plant, to produce 350 tons of pig iron per day.

One battery of by-product coke ovens to supply coke both for the blast furnace and also for sale purposes.

Four open-hearth steel furnaces, each of 60 tons capacity, and a hot-metal mixer of 500 tons capacity.

One blooming mill—latest type, electrically driven, with soaking pits, shears, cranes, and complete equipment. Blooms, billets, structural, and angle iron will be sold.

One combination rail and structural mill, with all necessary equipment, cooling beds, cranes, shears, saws, etc. The plant to be erected will have a capacity of from 800 to 1000 tons of rails per day when required.

All the ordinary merchant mills have been provided for the production of flats, sheets, rounds, small shapes, rods, wire and nails, corrugated iron, railroad spikes, fishplates, small rails, small angles, and structural iron, galvanizing plant, etc.

To maintain the plant and also assist in construction work, several large shops are being provided, including foundry, machine, boiler and structural, electric, pattern and carpenters', and plumbers' and pipe shops.

The layout of the plant has been so arranged that any portion of the works can be duplicated or triplicated if need be, without disturbing the location or running of any other portion. Space has even been left for a large plate-mill, which may be erected some time in the future should the State decide to add shipbuilding to its list of ventures.

J. W. Brophy is the Government expert who conducted the investigation and recommended Bowen as the most suitable site. It is estimated that the plant will not cost less than £2,500,000.

New Interests in Hack Saw Blade Manufacture

The Victor Saw Works, Springfield, Mass., manufacturer of hack saw blades, has been purchased by New York banking interests and new officers elected as follows: Winthrop Sargeant, Jr., Philadelphia, president; George J. Siedler, Philadelphia, vice-president and general manager and resident officer in charge operations; Louis J. Oswald, New York, treasurer; Wm. P. Jeffrey, New York, secretary. W. F. Pollock will remain with the company as assistant manager. The Napier Saw Works, Springfield, Mass., has also been acquired by the same interests, the purchase taking in the hack saw blade business, good will and equipment, but not the plant. The old owners of the Napier works, as is announced elsewhere, retain the factory and the band saw and band saw machine end of that business.

Equipment for Car Making

The Tennessee Coal, Iron & Railroad Co. is to install equipment for the manufacture of pressed steel cars complete as an adjunct to the Fairfield, Ala., plate mills that are manufacturing ship plates. This work is on the 1920 schedule.

Greaves-Etchells electric furnaces have been started at the works of the Dodge Steel Casting Co., Philadelphia, the American Radiator Co., Buffalo, and the Hammond Steel Co., Syracuse, N. Y.

Decreased Immigration—Less Production*

Federal, State and Municipal Governments Need to Co-operate to Give Immigrant Medical, Legal, Educational, Social and Political Help

BY JOHN E. OTTERSON

INDUSTRY to-day is suffering many unfortunate reactions growing out of the war and perhaps not the least of these is the reaction growing out of the failure of immigration. I am informed that before the war we had about 1,250,000 immigrants per year coming into this country and to this number about 30 per cent or 240,000 were of the unskilled laboring class. Since the war we have had about 250,000 a year, and of this number about 35 per cent have been of the unskilled class. As a result of this condition we are to-day about 4,000,000 short in immigrant labor. It is estimated that five times as many unskilled immigrant workers have left this country as have come into it in the year since the signing of the armistice. This condition has been further aggravated by the peculiar industrial situation resulting from war conditions. During the war it became necessary to take men out of peace time industries and put them into war time industries, with the result that the labor of this country was entirely redistributed. The effect of this was to create an abnormal demand for skilled labor in many of the wartime industries and since those industries did not themselves in the natural course of events furnish that skilled labor, it became necessary to draw upon the ranks of the less skilled labor for the purpose of creating the skilled labor that was required and industry engaged in an intensive development and instruction process for the purpose of bringing out skilled labor. The result was the depletion of the ranks of unskilled labor and the creation of a vacuum at the bottom. This condition is constantly present more or less in American industry, and it adjusts itself under normal conditions by drawing upon the unskilled labor of Europe.

Occasionally Unskilled Wages Higher Than Skilled

During the war, since we were not able to maintain our normal rate of immigration, the vacuum has continued and increased. The result to-day is that the wages of unskilled labor have risen to an abnormal degree, and in many instances to-day if you desire men to work in the unskilled trades it is necessary to pay them higher wages than they might receive in the more skilled trades. The work of the unskilled trades is frequently of such a disagreeable and annoying character that in order to induce a man to engage in that kind of occupation when he can find other and more congenial occupation elsewhere, you must pay him a higher wage.

This increase in wage in industry has brought about an unfortunate condition in agriculture, in that the labor from the farms, attracted to the cities by the higher wages and the more congenial life, have left the farms with practically no labor. The result is that we learn to-day that the farmers of the country are contemplating reducing their crops and it is probable that the cost of living will be further increased by the lack of foodstuffs resulting from this reduction in crops.

The result of these conditions is apparent in all industries to-day—in manufacturing, in transportation and in agriculture.

American industry to-day has possibly the greatest opportunity that it has ever had in the history of this country. It is called upon to-day to supply, not only the needs of our own people, but the needs of the world, and there is a tremendous opportunity in this direction, but due to the lack of a proper labor supply we are not in a position to avail ourselves of this opportunity.

Unless American industry can devise some method for supplying the unskilled labor that is required in order to fill this vacuum and to create a source of supply for more highly skilled labor, the unfortunate industrial conditions that exist to-day are going to become more aggravated and wages are going to become higher and the cost of living higher.

The obvious remedy for this condition is to increase immigration, and in order to accomplish this we face two problems, namely: to get and to hold.

Government Should Provide for Selective Immigration

In the problem of getting more immigrant labor the Government must take the lead and must co-operate with industry. If an effort to increase the supply of immigrant labor is to become effective in an industrial sense, it must be done on a selective basis, and in order that that selection may be wisely done the Government must have the co-operation, the advice and the counsel of industry.

It seems essential, therefore, that the Government should pass adequate laws to take care of selective immigration and that proper agencies and instrumentalities should be created to bring about the necessary co-operation between industry and the Government.

When we come to the problem of holding the immigrants after they have arrived, and of moulding them into our American life, it will require the co-operation of national, state and municipal government agencies and of industry. We require national sentiment and local action. The sentiment in favor of this must be a national one and must be created in a national sense. But the action, insofar as it is practical, concrete and effective, must be to a large extent local, and that means the intimate co-operation between local municipal governments and local agencies and civic bodies and local industries.

The immigrant to-day does not require a fanatical Americanization of the hymn-singing sort. He requires more particularly decent human treatment. We must establish in our communities agencies and a sentiment that will protect the immigrant against ridicule, contempt, persecution, exploitation, extortion and injustice. When you call a foreigner a "dago," you make more of an impression upon him than when you induce him to sing the Star Spangled Banner, and the two impressions are opposite and certainly offset each other.

If it is true that foreigners sometimes regard Americanization as materialization, then we have an obligation to create a different impression in the minds of the foreigners as to the proper meaning of Americanization.

First, Teach the English Language

They need, first, to be taught the English language. They need the English language in order that they may have a better understanding of our American institutions and may develop a deeper sympathy with our American people, and in order that they may form American friendships.

I am told that the number of industrial accidents among foreign-speaking industrial workers is about twice as great as among English-speaking industrial workers, and that the severity of these accidents is about 50 per cent greater, so that in an industrial sense it is important that these foreigners be taught to speak English, and in this respect the industries themselves, as well as the communities, have a very

*A paper delivered at the National Conference on Immigration on April 7, under the auspices of the Inter-Racial Council in the Engineering Societies Building, New York. The author is president of the Winchester Repeating Arms Co.

definite and practical responsibility and obligation.

Aside from this human reception of the foreigners, and of our efforts to teach them English, as I see them in our industrial communities, they require something in the nature of a civic service. Generally speaking, they are shy and hesitant, and many times they are exploited because of their ignorance of our customs and their inability to get proper counsel and advice, so that if we could establish some sort of civic service in our communities that will give these people something in the nature of guidance, of a medical, a legal, an educational, a social, a personal or political sort, it would assist very greatly in making American citizens out of them.

Should Imbibe Spirit of Citizenship

It does not seem to me so desirable to try to accelerate the process of making these foreigners technically American citizens. It seems more important that they should imbibe the spirit of Americanism rather than they should be driven to technically qualify as American citizens by taking out their citizenship papers.

Now, in this matter we all have a tremendous responsibility, and it seems to me that whether we are of the Government service, of the professions, of industry or of agriculture, it is up to us to play together with a reasonable and proper team-work—not the kind of team work that the farmer referred to when he said that he had the most willing team in the world; that the "off" horse was willing to pull all the load and the "nigh" horse was willing to let him do it.

And so, if I were to make a recommendation on the part of industry, it would be that the Government take the lead in passing proper laws and establishing the proper agencies for obtaining the advice and counsel of industry to the end that we might develop a proper system for the selective control of immigration in order that we might prevent the coming into this country of immigrants who are not desirable or necessary to our national growth and development, and at the same time might accelerate the flow of immigrants who are necessary and desirable.

And I would further recommend an uplift of national sentiment in favor of the square deal to the immigrant as a human being and the establishment of national and local agencies for his protection, encouragement and development in the ways of true Americanism. Let us develop in his mind by our example and our contact with him a full, deep, kindly and unselfish significance in our Americanism to the end that he may regard America not only as a land of political freedom and of material opportunity, but also as a land of happiness, kindliness and a square deal where the strength of men is developed and their weakness or misfortune not abused.

A Good Sign for the Shop

A suggestion for a sign, preferably large enough so that it can be easily read, that could well be put up, say in the shipping department, is contained in a notably crisp summary of the railroad transportation situation received from the Material Handling Machinery Manufacturers Association. This hint comes in the shape of a bulletin from the association, which has headquarters at 35 West Thirty-ninth St., New York, and is entitled "A Way to Help Others Help You." The part which could be made use of in the suggested sign is as follows:

A WAY TO HELP OTHERS HELP YOU

In the United States there are about 2,452,000 freight cars now in use. These are rolling in trains loaded and empty only 9.03 per cent of the time. They average 11.29 per cent time loading and 11.29 per cent being unloaded, if every car is released before demurrage starts. The balance of 68.39 per cent is waste time, due to repairs, switching and unnecessary delays.

One hour saved each day for each car would equal 2,452,000 car-hours per day. Dividing this figure by 24 (hours per day) it is self-evident that the public would have over 102,000 additional cars to use through this simple saving of one hour per car per day.

Westinghouse Opens Employees' Café

On April 6, when the largest industrial eating place in the world was officially opened by the Westinghouse Electric & Mfg. Co. at East Pittsburgh, evidence was given of what the larger manufacturers of to-day are doing in the way of providing for the comfort of their employees. This new cafeteria, which is a three-story, reinforced concrete and brick building, 100 by 236 ft., has a seating capacity on the first two floors alone of nearly 2600 persons. In addition, on the third floor is a dining room with a capacity of 500 and an auditorium with a seating capacity of 1000.

One of the main features is the fact that there are no steps in the main part of the building. Gradual inclines or ramps are used exclusively in order to facilitate moving the diners from floor to floor.

The first and second floors are devoted to cafeteria service, a section being reserved for women employees of the company. By means of the auditorium on the third floor, a suitable meeting place for the various employees' associations and organizations is obtained. The auditorium is equipped with a stage 18 by 26 ft. complete with footlights, stage settings, and a convenient dressing room. A motor-driven motion-picture machine of the very latest type is installed in an asbestos booth in the rear of the auditorium, and will be used in connection with various lectures, entertainments and other gatherings held under the auspices of the company, or some of its employees' organizations.

The cafeteria is equipped with the most modern labor-saving conveniences that are obtainable. On the first and second floors are eight service counters, 16 coffee urns milk freezers with a capacity of 40 gallons each, and sanitary drinking fountains. Soiled dishes are carried from the first and third floors to the second floor, where two large motor-driven dish washers are installed, which wash and dry the dishes.

A portion of the first floor adjacent to the cafeteria is fitted up with a motor-driven washing machine, mangles, steam dryer, for the purpose of washing and drying linens, motor-driven ice cream freezer with a capacity of 10 gallons, and an ice making machine with a capacity of 2000 pounds every 12 hours. The ice manufactured is used for the purpose of packing ice cream, cooling butter, making iced tea, lemonade, etc. There is also an ice cream storage, artificially cooled.

All food will be cooked on the third floor and will be supplied to the cafeterias by sub-conveyors. The kitchen is equipped with every possible method of convenience.

Report on Employee Representation

WASHINGTON, April 13.—Interest in schemes under which employees are given representation in the management of large industries has been stimulated by the final report of the President's Second Industrial Conference. The Bureau of Mines of the Department of the Interior has just issued a report on the subject. Reference is made in the report to the experience of the Colorado Fuel & Iron Co., the Midvale Steel & Ordnance Co., the Youngstown Sheet & Tube Co., and other large corporations.

In its final report, the Industrial Conference stated that joint organization of management and employees had been successful where undertaken in sincerity and good will. It was stated that this was not a field for legislation because the form which employee representation should take might vary in every plant, but that the conference recommended steps along this line to managers and employees. The conference said that if the joint organization of management and em-

ployees in the plant or industry failed to reach a collective agreement, then a Governmental system of settlement of disputes should be available, but that the building up of the shop councils was a desirable step.

The Bureau of Mines' report on the subject, prepared by T. T. Read, describes four typical systems of employee representation in industry. These are known as the Colorado Plan, Industrial Democracy, the Works Council, and a Modified System of Works Councils. Of these the Industrial Democracy and the Works Council, or Whitley Plan, have been the more popular in England. Mr. Read devotes himself to a discussion of the Colorado plan, and the so-called Industrial Democracy.

A summary of the plan of organization adopted by the Colorado Fuel & Iron Co., and the agreement entered into between the company and the men, is quoted by Mr. Read from an address by John D. Rockefeller, Jr., before the Civil and Commercial Club of Denver. Mr. Read adds:

"E. S. Cowdrick, assistant to the president, Colorado Fuel & Iron Co., in a recent address stated, that the period of probation of the plan is over, it already having paid satisfactory dividends in better efficiency. He attributes the lack of violence last fall to the employees' representation plan.

"It would appear that one of the principal factors in the successful operation of such plans is to determine what matters are in the proper field of these joint committees. It can readily be understood that matters regarding the management of operations might be brought up for discussion that the management might be unwilling to admit as proper subjects for action upon by the employees. The provision in the Youngstown plan for arbitration covers this point. It is probable that as more experience is gained in the operation of such plans this, and other matters that are as yet undefined will become matters of general agreement."

Considering Industrial Legislation

WASHINGTON, April 13.—Consideration of industrial legislation has been begun by the Senate Committee on Education and Labor. A number of prominent witnesses including William Howard Taft, Frank P. Walsh, and Basil M. Manley, all former chairmen of the War Labor Board; Samuel Gompers, Secretary of Labor Wilson, Herbert Hoover, and others, are to be summoned. Consideration will be given to the recommendations of the President's second industrial conference relative to the establishment of a national tribunal for the adjustment of industrial wage disputes.

The only witness thus far has been W. Jett Lauck, former secretary of the War Labor Board. Mr. Lauck is severely critical of the report of the second industrial conference, looking at it in much the same way as spokesmen for organized labor. Senator Kenyon of Iowa, chairman of the committee, apparently takes a similar view, and the committee would seem to be starting its inquiry with a prejudice against the recommendations of the industrial conference.

Mr. Lauck holds that the industrial conference report does not provide for any principles to be used as a basis for determining labor disputes, and, that while it recommends regional boards of adjustment, the need is, in his opinion, for industrial boards such as a metal trades board, mining board, iron and steel board, etc. Mr. Lauck also does not like the emphasis placed by the conference upon the operation of shop councils, and its tendency toward recognition of all classes of employees, whether organized or not.

"Unfortunately, a conflict between capital and labor has been developed and constantly accentuated ever since the armistice," said Mr. Lauck. "The general spirit of good feeling immediately following the war and the hope for a general agreement on a constructive program has been dissipated by two factors; the fear of the extreme radicalism in the labor movement, and the conniving of obstructionists, or a small group of irreconcilables among employees who do not wish any progress made, but a return to pre-war conditions.

"As a consequence, we have had the steel strike, the coal strike, and other smaller conflicts, and the practical failure of two industrial conferences. A conflict has also been precipitated between capital and labor of such intensity that there is now no prospect for agreement between them.

"It was hoped that as the result of the recent industrial conference an agreement could be reached as an immediate basis of procedure. It was thought that a series of principles, or a constitution, would be adopted which would set forth the fundamental rights and standards of employees in their relations with employers. It was also thought possible to agree upon agencies for the interpretation and administration of these principles so that industrial warfare may be prevented and stability maintained. None of these hopes has been realized.

"The only hope now is for Congress to lay down a basis of procedure, or to create machinery for the adjustment of industrial disputes and enact a code of principles, or give its sanction to principles which shall be mandatory in settling disputes. Machinery without governing principles is futile."

In the Field of Labor

There is still a shortage of labor, mostly common labor, among the industries in the Sharon and New Castle, Pa., districts. Recently, the American Sheet & Tin Plate Co. was operating only 25 out of 30 hot tin mills in its Sharon, Pa., works, on account of lack of men. It is feared that when the warm weather comes, the shortage in labor will grow more acute, as many men do not like the hot work in the mills in summer and seek outside jobs.

Granting of a 40 per cent. wage increase to its trainmen by the Pennsylvania-Ohio Electric Co., which operates in the Mahoning and Shenango valleys, averted a rail strike that would have seriously crippled iron and steel industries. Car men were advanced from 43, 46 and 48c. per hour to 60, 63 and 68c., depending on length of service.

The North Cornwall blast furnaces of the Bethlehem Steel Co., Lebanon, Pa., were blown in last week after an idleness of almost two years, during which many improvements were made.

Helpers employed at the Davis & Farnum Foundry, Waltham, Mass., are on strike for a 25 per cent wage increase. The men have been receiving an average of about $4 per day, about a month ago having been given an 11 per cent wage increase.

Several hundred men employed at Brown & Sharpe Mfg. Co., Providence, R. I., machine tools, etc., have quit work because of a cut in wages. Many of them have found employment in other New England cities.

The Chicago Foundrymen's Association, composed of employers in closed shops in Chicago, has been notified by the molders' union that a new agreement will be asked for when the present contract expires on May 1. The present schedule provides for $6.40 for 8 hr., but a voluntary increase was granted a few months ago, making the actual schedule $7 per day of 8 hr. The demands of the men are said to be $1.25 an hour.

The Scranton Pump Works, the Scranton Stove Works, the National Marine Engine Co., the Bolt and Nut Works, and the Finch Mfg. Co., all of Scranton, Pa., are badly crippled as a result of a strike of molders last week for an increase in wages of from 78 to 90 cents per hour.

The Champion Blower & Forge Co., Lancaster, Pa., which is contemplating extensive improvements, last week granted a voluntary increase of 10 per cent to all employees, effective at once. An additional concession of a 9½-hour instead of 10-hour working day, with same wages, was granted at the same time.

Non-Ferrous Metals

Cents Per Pound for Early Delivery

April	Copper New York Lake	Copper New York Electrolytic	Tin New York	Lead New York	Lead St. Louis	Zinc New York	Zinc St. Louis
7	19.50	19.25	61.75	9.10	8.85	8.85	8.50
8	19.50	19.25	61.40	9.20	8.95	8.75	8.40
9	19.50	19.25	61.75	9.25	9.00	8.75	8.40
10	19.50	19.25	....	9.25	9.00	8.75	8.40
12	19.50	19.25	63.50	9.25	9.00	8.75	8.40
13	19.52	19.25	63.25	9.25	9.00	8.75	8.40

NEW YORK, April 13.

Due to the industrial uncertainty caused by the railroad situation, all the markets are quiet and marking time. Buying of copper has slackened but prices are firm. A heavy business has been done in tin but the market is now dull. Prices for lead are higher and the market is strong. The zinc market continues inactive with prices easier. Antimony is a little lower.

New York

Copper.—Because of the heavy buying during March and early April leading consumers are apparently well covered for present needs and leading producers are comfortably sold for April-May shipment. This situation, coupled with the railroad disturbance, has caused a slackening in the demand, but the market, although quiet, is strong. Leading producers maintain their quotations for electrolytic copper for April-May shipment firmly at 19.25c., New York, with a slight premium for June shipment and are not interested in quoting beyond the second quarter. Lake copper is also unchanged at 19.50c. for the same delivery. There is also a secondary or outside market in which a limited amount of electrolytic copper is available as low as 18.50c., New York, and some sales have been made in both markets at the levels noted.

Tin.—Last week, Thursday and Friday, April 8 and 9, there were exceedingly heavy sales of tin. On the former day spot Straits sold at a range of 61.25c. to 61.50c. and on Friday at a range of 61.50c. to 62c. The buying consisted largely of prompt delivery metal and metal to arrive in April and May, and the demand was so strong that it extended into purchases of future shipments from the East. This buying was participated in mostly by consumers and to a less extent by dealers. On Thursday the statistics of the movements of tin for March appeared which corroborated the suggestion of last week that the amount of metal available for consumers the latter part of April and during May might be inadequate. Buyers immediately sensed the seriousness of the situation, especially the larger consumers, and entered the market. This explains the heavy buying referred to. The same conservatism prevailed, however, that has existed for some time, that is, that consumers immediately refrained from the market when prices advanced. On Monday the London market advanced £13 per ton and to-day is £1 higher, which tendency put a stop to buying, with the result that to-day the market is extremely quiet. Spot Straits in London is quoted at £346 5s. per ton to-day with the same position here quoted at 63.25c. per lb., New York. Should the London market recede in the next day or so a good buying movement is expected on this side. The railroad situation also makes for great uncertainty. Arrivals so far this month have been 934 tons and the quantity afloat is reported at 3916 tons.

Lead.—The market has become stronger and is still governed by the fact that supply is not equal to the demand. This situation has been intensified by the railroad strike, which has made arrivals in this market very light. Prompt lead cannot be obtained at less than 9.25c., New York, which we quote as the market, and has even sold as high as 9.37½c. The St. Louis position is quoted at 9c. The quotation of the leading producer is unchanged at 9c., St. Louis, and 9.25c., New York. The outside market and that of the leading interest are therefore on a parity.

Zinc.—The market continues exceedingly quiet, and quotations, which are largely nominal, have receded. Prime Western for early and second quarter delivery is generally quoted at 8.40c., St. Louis, or 8.75c., New York. Buying is very light. The leading producers are not anxious sellers. One cause of the recession is due to the selling on this side by British traders who are offering metal which they have bought for export and which they can sell here to advantage and repurchase on the other side at lower figures. The railroad situation is also a factor making for hesitancy.

Antimony.—Wholesale lots of the better grades are obtainable at 11c., New York, duty paid, for early delivery, with demand very light.

Aluminum.—Virgin metal, 98 to 99 per cent pure, is unchanged at 33c., New York, from the leading producer or 31c. from outside sellers, these quotations applying to wholesale lots for early delivery.

Old Metals.—The unsettled conditions, due to the strike, have kept the market in a very dull condition. Dealers' selling prices are as follows:

	Cents Per Lb.
Copper, heavy and crucible	19.00
Copper, heavy and wire	18.00
Copper, light and bottoms	16.25
Brass, heavy	14.00
Brass, light	10.00
Heavy machine composition	18.25
No. 1 yellow rod brass turnings	11.50
No. 1 red brass or composition turnings	16.00
Lead, heavy	8.00
Lead, tea	6.50
Zinc	6.00

Chicago

April 13.—Copper has been moving in good volume and is firm at 19.75c. Tin continues to fluctuate but for the past few days has been on an upward swing, now commanding 65c. There has been little activity in lead and spelter and both have declined. The demand for antimony is good and buying has been in fair volume. The old metals remain unchanged. We quote Lake copper 19.75c. for carloads, tin 65c., lead 8.75c., spelter 8.50c. and antimony 12c. On old metals we quote copper wires, crucible shapes, 15.50c.; copper clips, 15.25c.; copper bottoms, 14c.; red brass, 15.50c.; yellow brass, 11.25c.; lead pipe, 7c.; zinc, 6c.; pewter, No. 1, 37.50c.; tinfoil, 40c., and block tin, 50c., all these being buying prices for less than carload lots.

A new company headed by Fred T. Ley, formerly president of the Napier Saw Works, Inc., Springfield, Mass., and Henry F. Blanchard, formerly vice-president and general manager, has been organized to take over only the band saw and band saw machine business of the last named company. The new company will be known as the Metal Saw & Machinery Corporation and will be located in the Springfield, Mass., plant heretofore occupied by the Napier Saw Works. Mr. Ley is president of the new company and Mr. Blanchard vice-president, treasurer and general manager. They expect to employ 100 persons. This year's schedule calls for the production of several hundred machines, but it is intended to turn out more than 2000 in 1921. The company is represented in Japan and Spanish speaking countries.

The Norton Co., Worcester, Mass., has started work on the large addition to its machine division, consisting of a steel and concrete, brick-faced six-story building containing 60,000 sq. ft. of floor space. Eventually the structure will be occupied for machine shop purposes, but in the beginning will be devoted to storage of completed machines and their parts, and to the pattern shop, carpenter shop and cooper shop, which at present are distributed through the buildings of the two divisions.

The summer meeting of the Society of Automotive Engineers will be held at Ottawa Beach, Lake Michigan, June 21 to 25 inclusive.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

Freight rates from Pittsburgh on finished iron and steel products, with revisions effective Jan. 1, 1920, in carloads, to points named, per 100 lb., are as follows: New York, 27c.; Philadelphia, 25c.; Boston, 29½c.; Buffalo, 21c.; Cleveland, 17c.; Cincinnati, 23c.; Indianapolis, 24½c.; Chicago, 27c.; St. Louis, 34c.; Kansas City, 59c.; St. Paul, 49½c.; Denver, 99c.; Omaha, 59c.; New Orleans, 38.5c.; Birmingham, 57.5c.; Pacific Coast, $1.25. Minimum carload 80,000 lb., except 36,000 lb. to St. Paul, Kansas City and Omaha, and 40,000 lb. to Denver. To the Pacific Coast the rate on steel cars and structural steel is $1.315, minimum carload 40,000 lb.; and $1.25, minimum carload 50,000 lb. On wrought iron and steel pipe the rate from Pittsburgh to Kansas City is 56c. per 100 lb., minimum carload 46,000 lb.; to Omaha, 50c., minimum carload 46,000 lb.; St. Paul and Minneapolis, 49.5c., minimum carload 46,000 lb.; Denver, 99c., minimum carload 46,000 lb. Jacksonville, Fla., all rail, car lots, 41.5c.; less, 59c.; rail and water, car lots, 34.5c.; less 46.5c. A 3 per cent transportation tax applies. On iron and steel items not noted above rates vary somewhat and are given in detail in the regular railroad tariffs. Ship plates to Pacific Coast points are $1 per 100 lb.; minimum carload, 80,000 lb.

Structural Material

I-beams, 3 to 15 in.; channels, 3 to 15 in.; angles, 3 to 6 in., on one or both legs, ¼ in. thick and over, and zees, structural size, 2.45c. to 4c.

Wire Products

Wire nails, $3.25 to $4.00 base per keg; galvanized, 1 in. and longer, including large-head barbed roofing nails, taking an advance over this price of $1.50 and shorter than 1 in., $2.00. Bright basic wire, $3 to $3.50 per 100 lb.; annealed fence wire, Nos. 6 to 9, $3 to $3.50; galvanized wire, $3.70 to $3.95; galvanized barbed wire and fence staples, $4.10 to $4.45; painted barbed wire, $3.40 to $3.75; polished fence staples, $3.40 to $4.50; cement-coated nails, per count keg, $2.85 to $3.75; these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days net, less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 60 per cent off list for carload lots, 59 per cent for 1000-rod lots, and 58 per cent for small lots, f.o.b. Pittsburgh.

Bolts, Nuts and Rivets

Large structural and ship rivets ..... $4.50 base
Large boiler rivets ..... $4.60 base
Small rivets ..... 50 per cent off list
Small machine bolts, rolled threads, 40, 10 and 5 per cent off list
Same sizes in cut threads ..... 40 and 5 per cent off list
Longer and larger sizes of machine bolts, 30 and 10 per cent off list
Carriage bolts, ⅜ in. x 6 in.:
Smaller and shorter, rolled threads. 40 and 5 per cent off list
Cut threads ..... 30 and 10 per cent off list
Longer and larger sizes ..... 30 per cent off list
Lag bolts ..... 50 per cent off list
Plow bolts, Nos. 1, 2 and 3 head ..... 40 per cent off list
Other style heads ..... 20 per cent extra
Machine bolts, c.p.c. and t. nuts, ⅜ in. x 4 in.:
Smaller and shorter ..... 35 per cent off list
Longer and larger sizes ..... 25 per cent off list
Hot pressed and cold pressed sq. or hex. blank nuts. 2c. off list
Tapped nuts ..... $1.75 off list
Semi-finished hex. nuts, U. S. S. and S. A. E.:
⅝-in. and larger ..... 60 and 5 per cent off list
9/16-in. and smaller ..... 70 and 5 per cent off list
9/16-in. and smaller A. L. A. M. or S. A. E.: 70, 10 and 5 per cent off list
Stove bolts in packages ..... 70 and 10 per cent off list
Stove bolts in bulk ..... 70, 10 and 2½ per cent off list
Tire bolts ..... 55 and 10 per cent off list
Track bolts ..... 6c. base
One cent per lb. extra for less than 200 kegs. Rivets in 100-lb. kegs 25c. extra.
All prices carry standard extras f.o.b. Pittsburgh.

Wire Rods

No. 5 common basic or Bessemer rods to domestic consumers, $52 to $70; chain rods, $75 to $80; screw rivet and bolt rods and other rods of that character, $65 to $70. Prices on high carbon rods are irregular. They range from $75 to $100, depending on carbons.

Railroad Spikes and Track Bolts

Railroad spikes, ½ to 9/16 in. and larger, $4.00 per 100 lb. in lots of 200 kegs, of 200 lb. each or more; spikes, ¾-in. and 7/16-in., $4.25; 5/16-in., $5; track bolts, $4.90 to $5. Boat and barge spikes, $4.50 per 100 lb. in carload lots of 200 kegs or more, f.o.b. Pittsburgh. Tie plates, $3 to $4 per 100 lb.

Terne Plates

Prices of terne plates are as follows: 8-lb. coating, 200 lb., $13.80 per package; 8-lb. coating, I. C., $14.10; 12-lb. coating, I. C., $15.80; 15-lb. coating, I. C., $16.80; 20-lb. coating, I. C., $18.05; 25-lb. coating, I. C., $19.30; 30-lb. coating, I. C., $20.30; 35-lb. coating, I. C., $21.30; 40-lb., coating, I. C., $22.30 per package, all f.o.b. Pittsburgh, freight added to point of delivery.

Iron and Steel Bars

Steel bars at 2.35c. to 4c. from mill. Common bar iron, 4.50c.

Wrought Pipe

The following discounts are to jobbers for carload lots on the Pittsburgh basing card, discounts on steel pipe, applying as from Jan. 14, 1920, and on iron pipe from Jan. 7, 1920:

Butt Weld

Steel			Iron		
Inches	Black	Galv.	Inches	Black	Galv.
⅛, ¼ and ⅜	47	20½	⅛ and ¼	1	+25
½	51	36½	⅜	25½	+ 1½
¾ to 3	54	41½	½	29½	11½
			¾ to 1½	34½	18½
			2 and 2½	33½	17½

Lap Weld

2	47	34½	1¼	24½	9½
2½ to 6	50	37½	1½	31½	17½
7 to 12	47	33½	2	28½	14½
13 and 14	37½		2½ to 6	30½	17½
15	35		7 to 12	27½	14½

Butt Weld, extra strong, plain ends

⅛, ¼ and ⅜	43	25½	¼	+7	+40
½	48	35½	⅜	23½	6½
¾ to 1½	52	39½	½	28½	15½
2 to 3	53	40½	¾ to 1½	34½	19½
			2 and 2½	34½	19½

Lap Weld, extra strong, plain ends

2	45	33½	1¼	21½	6½
2½ to 4	48	36½	1½	27½	13½
4½ to 6	47	35½	2	29½	16½
7 to 8	43	29½	2½ to 4	31¼	19½
9 to 12	38	24½	4½ to 6	30½	18½
			7 to 8	22½	10½
			9 to 12	17½	5½

To the large jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variations in weight of 5 per cent.

On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to jobbers have been seven (7) points lower (higher price) than carload lots and on butt and lap weld galvanized iron pipes have been nine (9) points lower (higher price).

Boiler Tubes

The following are the prices for carload lots f.o.b. Pittsburgh:

Lap Welded Steel		*Charcoal Iron*	
3½ to 4½ in.	40½	1¾ and 1⅞ in.	+20
2½ to 3¼ in.	30½	2 and 2¼ in.	+10
2¼ in.	24	2½ and 2¾ in.	+ 1
1¾ to 2 in.	19½	3 and 3¼ in.	— 1½
		3½, 4 and 4½ in.	— 8

Standard Commercial Seamless—Cold Drawn or Hot Rolled

Per Net Ton		Per Net Ton	
1 in.	$327	1¾ in.	$207
1¼ in.	267	2 to 2½ in.	177
1⅜ in.	257	2¾ to 3¾ in.	167
1½ in.	207	4 in.	187
		4½ to 5 in.	207

These prices do not apply to special specifications for locomotive tubes nor to special specifications for tubes for the Navy Department, which will be subject to special negotiations.

Sheets

Prices of the Steel Corporation for mill shipments on sheets of United States standard gage in carloads and larger lots for indefinite delivery are given in the left-hand column. For reasonably prompt delivery, mills have no trouble in getting prices quoted in the right-hand column, or even higher prices.

Blue Annealed—Bessemer

	Cents per lb.
No. 8 and heavier	3.50 to 5.95
Nos. 9 and 10 (base)	3.55 to 6.00
Nos. 11 and 12	3.60 to 6.05
Nos. 13 and 14	3.65 to 6.10
Nos. 15 and 16	3.75 to 6.20

Box Annealed, One Pass Cold Rolled—Bessemer

Nos. 17 to 21	4.15 to 6.30
Nos. 22 to 24	4.20 to 6.35
Nos. 25 and 26	4.25 to 6.40
No. 27	4.30 to 6.45
No. 28 (base)	4.35 to 6.50
No. 29	4.45 to 6.60
No. 30	4.55 to 6.70

Galvanized, Black Sheet Gage—Bessemer

Nos. 10 and 11	4.70 to 7.50
Nos. 12 to 14	4.80 to 7.60
Nos. 15 and 16	4.95 to 7.75
Nos. 17 to 21	5.10 to 7.90
Nos. 22 to 24	5.25 to 8.05
Nos. 25 and 26	5.40 to 8.20
No. 27	5.55 to 8.35
No. 28 (base)	5.70 to 8.50
No. 29	5.95 to 8.75
No. 30	6.20 to 9.00

Tin-Mill Black Plate—Bessemer

Nos. 15 and 16	4.15 to 6.15
Nos. 17 to 21	4.20 to 6.20
Nos. 22 to 24	4.25 to 6.25
Nos. 25 to 27	4.30 to 6.30
No. 28 (base)	4.35 to 6.35
No. 29	4.40 to 6.40
No. 30	4.40 to 6.40
Nos. 30½ and 31	4.45 to 6.45

Strike Greatly Reduces Pig Iron Output

Many Blast Furnaces Banked and Numerous Rolling Mills Are Idle—Paralysis of Industry in the Central West Will Soon Come if Labor Troubles Continue

CLEVELAND, April 13.—Some of the steel plants and blast furnaces in Cleveland have been forced to shut down because of the switchmen's strike, and if the strike lasts many days the industry in northern Ohio will be paralyzed, as few plants will be able to operate more than a week. No freight is coming in or going out, and consumers are unable to get coal or coke. Steel shipments to this territory from the Pittsburgh and other districts are cut off and local steel plants and blast furnaces are unable to ship out their product of pig iron and semi-finished steel which are being piled in the yards, but some cars are available for steel mill products that will not be shipped out until the strike is over. The American Steel & Wire Co. has banked three of its local furnaces because of the scarcity of fuel, but other Cleveland furnaces are still in blast, as are also the Toledo, Canton, Detroit, Erie and other furnaces operated by Cleveland interests, except the Struthers furnace, which has been banked. Most furnaces are operating at minimum capacity to conserve fuel.

The American Steel & Wire Co. has shut down one blooming mill and its Bessemer plant in its Newburg works, and is operating its wire mills at reduced capacity. The Otis Steel Co. has shut down the two plate mills at its Lakeside plant. Yard crews have remained at work on the Newburg and South Shore Railroad of the American Steel & Wire Co. and on other local steel plant industrial railways.

Many manufacturing plants are still operating, but some are likely to shut down within a day or two. Some consumers are offering to use motor trucks for hauling steel from the mills.

Twenty Blast Furnaces in Mahoning Valley Banked

YOUNGSTOWN, OHIO, April 13.—Roadmen of the Pennsylvania and Pittsburgh & Lake Erie Railroad today joined the ranks of striking switchmen and yardmen of all carriers, curtailing freight and passenger transportation between this city and Pittsburgh.

Twenty of the 25 blast furnaces in the Mahoning Valley are banked and complete industrial suspension is imminent. The older men in the brotherhoods are opposing the strike, and are advising the insurgents to return to their posts. Lack of organization and leadership is apparent in ranks of the strikers. In the Shenango Valley plant operations are at a standstill.

Chicago Steel Plants Badly Crippled

CHICAGO, April 10.—The strike of railroad switchmen and yardmen, which started here last Monday, has severely crippled iron and steel production in the Chicago metropolitan district. The Illinois Steel Co. has been forced to bank six blast furnaces at Gary and four at South Chicago, leaving only five each in blast at these plants. Its coke output has been cut in two, and mill operation has fallen to about 60 per cent of capacity. While plenty of scrap is at hand, mill output is limited because of low pig iron stocks. Previous accumulations of steel in the plant yards, which were due to car shortage, are now being added to at an alarming rate. The Inland Steel Co., Indiana Harbor, Ind., has not yet been forced to bank any of its blast furnaces, but has reduced its mill output to about 50 per cent of normal. The Wisconsin Steel Works, South Chicago, has banked one blast furnace and is rolling steel at the rate of about 50 per cent of capacity. The Interstate Iron & Steel Co. has continued to operate its East Chicago and South Chicago plants throughout the week, but a shutdown at the former mill seems imminent. Its Grand Crossing wire works has but one department, a rod mill, operating. The East Chicago plant of the Republic Iron & Steel Co. and the blast furnaces and mills of the Steel & Tube Co. of America have continued to operate under grave difficulties. The Highland Iron & Steel Co. is still down at West Pullman, and fears that its Terre Haute, Ind., mill will be forced to close at the end of the current week.

Although the strike has spread to other parts of the country, outlying iron and steel plants have not as yet been as seriously affected as those in Chicago and the immediate vicinity. Neither the Joliet nor Milwaukee plants of the Illinois Steel Co. have found it necessary to curtail operation, and this is also true of the Moline, Ill., and Muncie, Ind., plants of the Republic Iron & Steel Co.

The General Managers' Association, representing the Chicago railroad managements, estimates that freight service here has been reduced to about 20 per cent of normal. Passenger service, however, is as yet unaffected. Most of the switchmen and yardmen in the Chicago switching district are on strike, but small numbers are returning to work, indicating that the morale of the men is weakening. Practically all enginemen have continued at their posts, but some firemen have joined the strikers. None of the National unions of railroad train service employees is in sympathy with the men. The Brotherhood of Railway Trainmen, in fact, has brought several hundred men here from other points to take the places of the strikers. Railroad officials and employees in other departments have also volunteered to make up for the deficiency in yard and switching crews.

The strikers have returned to work at Battle Creek, Mich., and on one large road at Kansas City.

The demands of the men, which were formulated without the authority of the National railroad unions, call for $1.50 an hour for enginemen, $1 an hour for firemen and 95c. for helpers, $5 a day for switchtenders handling three switches or less, and 95c. an hour for those handling more than three switches. Time and one-half for overtime and double time on Sunday are also asked.

Conditions at Buffalo

BUFFALO, April 13.—Of local steel plants, the Lackawanna Steel Co.'s rolling mills are down. Its blast furnaces are banked and its open hearths idle. The Donner Steel Co. rolling mills are down, but its blast furnaces are running full. The Rogers Brown Iron Co. and Buffalo Union Furnace Co. furnaces are running full. The Wickwire Steel Co. blast furnaces and mills are running full.

Decrease in Mining Accidents

WASHINGTON, April 13.—Statistics which have just been compiled by the Bureau of Mines, showing accidents in metal mines during the calendar year 1918, show the lowest fatality rate recorded since the bureau began the collection of accident statistics in 1911. The non-fatal injuries show a slight decrease, in spite of war conditions and labor shortage. There were 646 fatalities reported in 1918 in all kinds of metal mines. The fatality rate was 3.57 per 1000 300-day workers, as compared with the normal rate of 3.60 per 1000 for 1917 and 3.62 for 1916. The number of non-fatal injuries was 42,915 as compared with 46,286 in 1917, making a non-fatal accident rate of 237.09 per

1000 300-day workers, as compared with 240.97 per 1000 in 1917, and 250.64 in 1916.

The figures on accidents at iron mines are compiled from the reports of 176 iron-mine operators, who employed 53,665 men, of whom 28,775 were employed underground and 24,890, including those engaged in steam-shovel work, on the surface.

The number of deaths and injuries from accidents in these mines is as follows: Deaths, 179, or 3.45 per 1000 300-day employees, as compared with 3.54 in 1917; injuries, 9621, or 185.45 per 1000, as compared with 227.54 in 1917. Of the total number of fatalities, 128 occurred underground, or 4.49 per 1000 300-day workers underground; and 51 employees were killed while engaged in surface work, making this rate 2.18 per 1000 300-day workers on the surface.

Compared with the records of 1911 there is a small decrease in the accidents, both fatal and non-fatal, regardless of the conditions prevailing during the stress of war.

What Is the Safest City in America?

St. Louis lays formal claim to the title of safest city in America and 10 other cities, while not definitely questioning her right to it, are endeavoring to beat the record shown in the 1919 report of the coroner of St. Louis. These cities are Cleveland, Cincinnati, Pittsburgh, Kansas City, Wilmington, Del., New York, Minneapolis, Buffalo, Portland, Ore., and Rochester, in each of which the local council of the National Safety Council is now conducting a permanent public and industrial safety campaign. In a score of other cities, principally Detroit, Boston, Grand Rapids, Mich., Harrisburg, Pa., Milwaukee, St. Paul, Duluth, Toledo and Syracuse, N. Y., definite plans are under way for the establishment of similar local safety councils with a full time paid secretary.

Dr. R. S. Vitt, Coroner of St. Louis, lays claim for that city to the title "The Safest Big City in America" on the strength of a report which shows that in 1919 with a population of 922,000, St. Louis had fewer coroner's inquests than in 1901 when its population was only 604,000 and that industrial fatalities were reduced from 110 in 1917 to 42 in 1919. A comparative chart of coroners inquests reveals the fact that inquests in St. Louis jumped from 1200 in 1905 to 2000 in 1917 and that in the next two years dropped to 1400 as a direct result, the coroner says, of the safety campaign inaugurated at St. Louis during the 1918 Safety Congress and continued since then by the St. Louis local of the National Safety Council.

Cincinnati Machinists' Demands

The machinists' union of Cincinnati have presented demands to the manufacturers for an increase of 25 per cent in pay, effective May 1, and an answer is asked by April 17. The minimum scale asked for is 75c. an hour for machinists, 60c. an hour for specialists and 50c. for helpers. Employers are to signify their assent to the demands by posting notices in their shops on or before April 17 that these rates will be put into effect May 1. The letter states that no recognition of the union is asked for, and that the closed shop will not be demanded. It is understood that the employers will not accede to the demands of the men, and as the machinists claim to be organized 100 per cent, a strike is expected. Manufacturers are making preparations to keep their plants running, should a walkout occur, and are confident that even if a strike is declared it will be of short duration.

The average weekly earnings of labor in January, 1920, in pig iron and rolling mill products in New York State was $36.62 against $15.98 in the same month in 1915. The average weekly earnings in January in sheet metal work and hardware lines was $24.77; in machinery, including electrical apparatus, $28.18, and in cars, locomotives and railroad repair shops, $30.35.

Paper Manufacturer Wins $1,000 Prize in Tier-Lift Truck Contest

The first prize of $1,000 offered by the Lakewood Engineering Co., Cleveland, for the best treatise on industrial haulage, using Lakewood Tier-Lift trucks, was awarded by the committee appointed by the Society of Industrial Engineers to Clarence Irving McNair, Jr., of Cloquet, Minn. Mr. McNair, who is secretary of the Northwest Paper Co., Cloquet, won the prize with a paper entitled "Analysis of the Application of the Tier-Lift Truck to the Pulp and Paper Industry." The treatise indicates the possibilities of considerable savings in the handling of ground wood pulp by the Tier-Lift truck to and from storage either with or without a steam house process. The arrangement suggested by Mr. McNair would effect a reduction of wood pulp losses due to deterioration from the growth of fungi or to disintegration from over-long storage.

Second prize was awarded to F. C. Peters, chief mechanical engineer, and G. R. Reese, assistant mechanical engineer, New Jersey Zinc Co., Palmerton, Pa. This treatise, which deals with the handling of zinc oxide in barrels and bags, contains many valuable data for the movement of bag or barrel packages.

Theodore M. Prudden, Whitin Machine Works, Whitinsville, Mass., was awarded third prize for an analysis entitled "The Tier-Lift Truck—Its Field of Usefulness."

F. L. Usner, with L. V. Estes, Inc., Chicago, received honorable mention on his paper, "The Tier-Lift Method Applied to the Paper Industry." Frederick L. Fish, industrial engineer with the Fisk Rubber Co., Chicopee Falls, Mass., was also given honorable mention. This treatise was on "Application of Tier-Lift Truck to Stores Problem of Handling Materials."

The award committee consisted of A. Russell Bond of *Scientific American Monthly;* Prof. Dexter S. Kimball, dean of the School of Engineering, Cornell University, and Irving A. Berndt, vice-president of C. E. Knoeppel.

Griffenhagen & Associates, Ltd.

Arthur Young & Co., certified public accountants, Chicago and Milwaukee, announce that their industrial engineering department has been taken over by E. O. Griffenhagen, in charge of the department since 1911, and Thomas W. Howard, Fred G. Heuchling, Robert E. Goodell, W. G. Bailey, R. S. Holden, Fred Telford, R. O. Beckman, P. H. Myers and their colleagues of the department's staff, who will carry on the business under the name of Griffenhagen & Associates, Ltd., industrial engineers and employment advisors, 116 South Michigan Avenue, Chicago. The services of this organization, without change in personnel, will continue to be available to concerns which contemplate improvements in organization or methods of procedure, and desire counsel or assistance in problems of management, business organization, industrial relations, production control, cost accounting, or office system. Arthur Young & Co., as part of their general practice as certified public accountants, are prepared to continue to advise with their clients on accounting and cost systems.

New By-Product Coke Plant to Start in Summer

The first unit of the St. Louis Coke & Chemical Co. plant at Granite City, Ill., comprising 80 coke ovens and one blast furnace, will be in operation about the middle of July, if there is no unexpected delay in the delivery of equipment. The blast furnace will have the capacity of 500 tons of pig iron per day, which will be shipped as hot metal to the plant of the National Enameling & Stamping Co. The coke plant will handle 2000 tons of coal per day, and will produce about 1500 tons of metallurgical coke from 100 per cent Illinois coal. Part of the coke output will be used in the company's own blast furnace.

PERSONAL

Col. W. P. Barba, for years general manager Nicetown works, Midvale Steel Co., is scheduled to address the Philadelphia section of the American Society of Mechanical Engineers on April 27 on "Modern Practice in the Manufacture of Steel."

Dr. T. R. Palmer, Cumberland, Md., formerly captain of the First Maryland Infantry in the Mexican campaign, and later major of infantry in the regular army, has been appointed employment manager of the works of the N. & G. Taylor Co. at Cumberland, Md., manufacturer of steel and tin plate.

William C. Wright has opened an office in the Pennsylvania Building, Philadelphia, as a manufacturers' agent for the sale of iron and steel products. Among others he will represent the Wyoming Shovel Works, Wyoming, Pa., and the Central Tool Co., Inc., Providence, R. I., in the Philadelphia, Baltimore and Washington territory. Mr. Wright recently severed his connection with the Read-Rittenhouse Co., Philadelphia.

A. R. Steadfast, Hill, Clarke & Co., Inc., Boston, machine tools, has been elected a director of the Groton Iron Works, New London, Conn.

George Baily, formerly of the supply division of the Cincinnati office of the Westinghouse Electric & Mfg. Co., has been appointed industrial assistant to the manager of the supply department of that company at East Pittsburgh, Pa. During the war, Mr. Baily served as a major of the army engineers. J. T. Pace, formerly industrial assistant to the manager of the supply department, has been appointed assistant manager of the supply department. More recently, Mr. Pace has devoted a large part of his time to industrial applications of electricity, and to popularizing the use of electrical devices, including safety electrical appliances, in industrial plants. He is an active member of some of the engineering and trade organizations in the electrical industry.

E. M. Herr, chairman Westinghouse Electric & Mfg. Co., East Pittsburgh, has been elected a member of the board of trustees of the Yale Corporation at New Haven, Conn.

G. E. Stoltz, general engineer, Westinghouse Electric & Mfg. Co., East Pittsburgh, has been appointed engineer in charge of the steel mill section of the engineering department. After graduating from the electrical engineering course of Ohio State University in 1909, Mr. Stoltz entered the apprenticeship course of this company, after which he became engaged in steel mill work. W. E. Thau, general engineer, has been appointed engineer in charge of marine section of the engineering department. Mr. Thau was graduated from the University of Cincinnati in 1911, and was entered in the apprenticeship course of the Westinghouse company. Later he became engaged in steel mill and marine work. He has been in marine engineering work since this company became actively associated with the development of electrical equipment for this type of service.

Robert S. Alter, vice-president American Tool Works, Cincinnati, has been named as trade advisor in selling American machine tools in foreign countries, by the National Foreign Trade Conference. Mr. Alter will be in charge of the bureau for the information of foreign buyers of machine tools at the annual foreign trade convention to be held at San Francisco on May 12, 13 and 14.

Gilbert L. Robinson and Charles E. Masters left Vancouver on April 10 for Shanghai, where they will open an office for the Consolidated Steel Corporation, New York. The opening of the Shanghai office is in line with the corporation's policy of direct representation in important steel consumption centers of the world. In harmony with its policy, the export combine is represented directly in India, Australia, New Zealand, Africa, South America and Europe.

Comly B. Shoemaker, Jr., who left the Glasgow Iron Co., Pottstown, Pa., last November to become assistant superintendent of the Roe puddling department, Reading Iron Co., Reading, Pa., has returned to the former company as general superintendent.

Otto A. Yingling, formerly with the Washington Steel & Ordnance Co., is now with the Ward Tool & Forging Co., Latrobe, Pa., as general superintendent, having taken charge of his new position April 1.

Prof. Gaetano Lanza, Philadelphia, has been elected to honorary membership in the American Society for Testing Materials. There are now four honorary members of the society, the others being Dr. Henry M. Howe, Capt. Robert W. Hunt and Prof. Mansfield Merriman.

C. T. M. Green, Ingersoll-Rand Co., Easton, Pa., has been made superintendent of the plant of A. Hankey & Co., Rochdale, Mass., knife manufacturers.

George H. Fristoe has been appointed sales manager of the Stocker-Rumley-Wachs Co., machinery dealer, Chicago. Mr. Fristoe has been identified with the machinery business in Chicago for 15 years, during the last eight years being associated with the Stocker-Rumley-Wachs Co. and its predecessor, the Rumley-Wachs Co.

J. L. Edwards now represents the Mahr Mfg. Co., oil burning equipment, Minneapolis, Minn., in western Pennsylvania, with an office at 498 Union Arcade Building, Pittsburgh. Mr. Edwards succeeds J. S. Longnecker.

J. V. W. Reynders, who with a group of associates acquired the American Tube & Stamping Co., Bridgeport, Conn., in December, 1917, is relinquishing the presidency of the company, which he assumed temporarily during the reorganization period. Conditions brought about by the war necessitated his continuing as executive head beyond the period originally intended and Mr. Reynders has now asked to be relieved in order to devote his time more exclusively to his private practice as financial and commercial adviser in the manufacture of steel. He remains on the executive committee of the company and will also continue to act in an advisory capacity. Several millions have been put into the property by way of improvements, and operations for the current year indicate record figures for output and earnings.

At the April 3 meeting of Debevoise-Anderson Co., Inc., pig iron and coke, New York, the following officers were elected: President, Nils Anderson; vice-president, C. A. Wyatt, New England manager; treasurer, Charles A. Sleicher, president Troy Foundry & Machine Co.; secretary, W. K. Callow.

E. F. Axner, for many years in charge of pig iron sales for the Illinois Steel Co., Chicago, whose resignation was recently announced, has been elected treasurer of the Aetna Ball Bearing Mfg. Co., 213 Institute Place, Chicago.

Vance McCarty, general sales manager Edw. R. Ladew Co., Inc., manufacturer of leather belting, has been made vice-president of the company. Mr. McCarty's connection with the company covers the past 20 years and embraces every phase of the leather belting business including manufacture, sale, branch management and general sales direction. He will continue in direct control of Ladew sales policies, and has retained as assistant general sales manager Russell B. Reid, another belting expert with 20 years of leather belting experience.

Herman C. Menge, superintendent the Tuthill Spring Co., Chicago, for the past 25 years, has resigned to take a third interest in the Garden City Spring Works, Chicago.

Frederick G. Platt, formerly president, has been elected chairman of the board of directors, New Britain Machine Co., New Britain, Conn., manufacturer of a one-man tractor, etc. Herbert H. Pease is now president as well as treasurer. Abram Buol is vice-president; Charles R. Hare is vice-president in charge of production, and Stanley T. Gross is vice-president in charge of sales. Robert S. Brown is re-elected secretary and Herbert E. Erwin, assistant secretary.

Charles R. Sturtevant, Worcester, educational director American Steel & Wire Co., has been transferred to Cleveland, the future home of this department.

L. A. S. Wood, prominent in illuminating engineering circles in this country and in Europe, has been made manager of the illuminating section of the supply department of the Westinghouse Electric & Mfg. Co., with headquarters at South Bend, Ind.

A. Bradley Burgess, for several years vice-president and sales manager of the Standard Plunger Elevator Co., Worcester, Mass., and of its subsidiary, the Powell Machine Co., has resigned to become Eastern representative of the Haughton Elevator & Machine Co., Toledo, Ohio. Mr. Burgess is a graduate of the Worcester Polytechnic Institute, class of 1907, and has been with the Standard company ever since.

Guy B. Anderson, formerly coke sales manager Reilly-Peabody Fuel Co., Frick Building, Pittsburgh, has resigned. W. W. Peabody, vice-president of the company, formerly manager of sales of coal, is now manager of sales of coal and coke for the Reilly-Peabody Fuel Co., American Coke Corporation and George Creek Coal Mining Co.

Scandinavian Engineering Fellowships Awarded

The American-Scandinavian Foundation, acting upon nominations made by colleges of this country, has awarded to American students 20 traveling fellowships for study in Denmark, Norway and Sweden during the academic year 1920-1921. More than 150 application papers were considered by the committee of college professors and technological experts who made the selection. These fellowships are awarded annually and are part of an international exchange which provides also for 20 Swedish, Danish and Norwegian students at American colleges. The funds for the fellowships were pledged by Americans and Scandinavians desirous of promoting friendly relations and intellectual interchange between the countries of northern Europe and the United States.

Among those to study in Norway is Alexander Carson Maxwell, Austin, Tex., from University of Texas, to study hydro-electrical engineering. His alternate is Henry Pierce Massey, Brookline, Mass., from Massachusetts Institute of Technology.

To study in Sweden, Albert Paul Strom, Wahoo, Neb., from University of Nebraska, will go to cover hydro-electrical engineering. His alternate is Milton Leroy Almquist, Atwater Cal., from the University of California, to study electrical engineering. Albert William Demmler, Pittsburgh, Pa., from Pennsylvania State College, is to study electrometallurgy; his alternate is David Olson Lima, Hannaford, N. D., from the University of North Dakota, to study mining and metallurgy.

Titusville Iron Works Co. Expansion

The Titusville Iron Works Co., Titusville, Pa., has recently made a number of improvements which will materially increase the capacity of the plant. New crane quipment has been contracted for for the foundry and boiler shop, and a large number of new tools has been bought for both the foundry and machine shop. The company's new tank and stack shop is now in use, in which all the stacks and light tanks will be built enabling the main boiler shop to concentrate on larger and heavier work. The company manufactures a complete line of fire tube boilers of all types, together with steam and gas engines, pumps, tanks, stacks, etc.

OBITUARY

DR. JOHN A. BRASHEAR, scientist and well-known expert in the development and manufacture of astronomical instruments of precision, died at Pittsburgh, April 8, after a long illness.

DR. JOHN A. BRASHEAR

Dr. Brashear was born in Brownsville, Pa., in 1840, and educated in the public schools. He learned the machnists' trade and from 1860-1870 worked in the rolling mills of Pittsburgh. The study of astronomy, however, had been his hobby from boyhood, and all his spare time was devoted to it. In 1870 he attracted the attention of Langley, then head of the Allegheny Observatory, and through the assistance of William Thaw, one of the observatory patrons, set up a shop in Allegheny for the manufacture of astronomical instruments. In a short time he became widely known as an expert.

Perhaps his most important achievement was in connection with the design and development of the spectroscope for astronomical uses, particularly with reference to the mechanical features. In 1888 he completed the spectroscope for the 36-in. telescope of the Lick Observatory, furnishing the mechanical parts, and at the same time a complete small spectroscope, including the prisms and all other optical parts. From 1898 to 1900 he was acting director of the Allegheny Observatory, and through his efforts it was put in every possible way at the disposal of the public. For a number of years Dr. Brashear was a trustee of the Carnegie Institute of Technology, and it is said that he did more for the cause of education in Pittsburgh than any other three men.

He was a fellow of the American Association for the Advancement of Science and the Royal Astronomical Society of Great Britain; past-president of the American Society of Mechanical Engineers, Engineers' Society of Western Pennsylvania and the Pittsburgh Academy of Arts and Sciences and a member of other scientific associations.

JOHN JAY ORVIS, 80 years old, of Brooklyn, Civil War veteran, died April 7. When a young business man in Wisconsin, after the war, Mr. Orvis formed the J. I. Case Implement Co. He sold his interests therein 30 years ago and turned his activities to building and loan institutions. He was a pioneer in that field in Cuba.

American Can Co. to Auction War Plants

All war plant machinery, equipment and materials of the American Can Co., 120 Broadway, New York, will be sold at public auction April 27, at Geneva, N. Y.; April 28, at Kenilworth, N. J., and April 29, 30 and May 1, at Edgewater, N. J. The auction will include metal working machinery, small tools, conveyors, motors, electrical equipment, tanks, general factory equipment, general stores and 31 small frame and large structural steel buildings to be dismantled and removed. The 133-ft. twin screw steamer "Nassau" of 400 gross tons, with a capacity of 750 passengers, will also be auctioned. The sale is in charge of Philip Smith of Smith & Jaffe, 68 West Forty-fifth Street, New York.

"Holland's East Indies" is a fortnightly, illustrated review, devoted to the promotion of the interest of Holland's East India trade with other countries. It is edited and published by A. A. Van Der Kolk, Buitenzorg, Java, and among the articles in the first number is one entitled "A Steel Industry in Middle Celebes."

SHORT TRADE ITEMS

At a directors' meeting of the Material Handling Machinery Manufacturers' Association, New York, April 6, officers for the coming year were elected. Calvin Tomkins, who was succeeded to the presidency by Charles F. Lang, was made an honorary member of the organization as an expression of the appreciation of the association for his work and support. Three additional companies were elected to membership: The Whiting Foundry Equipment Co., Harvey, Ill., E. H. Bourne; Motors Terminal Co., Cleveland, B. F. Fitch; and the C. W. Hunt Co., Inc., West New Brighton, N. Y., S. S. Hathaway. The new officers of the association are: President, Charles F. Lang, president Lakewood Engineering Co., Cleveland; vice-president, Rumsey W. Scott, Otis Elevator Co., New York; treasurer, Lucian C. Brown, Elwell Parker Electric Co., New York; secretary and manager, Zenas W. Carter, New York.

D. A. Eddy, formerly manager of the stores and scrap section of the Ordnance Salvage Board in the Cincinnati district, and W. P. T. Baughman, formerly in charge of the Government's Ancor (Ohio) project, have formed a partnership under the name of Eddy & Baughman, for handling resale material. The offices of the firm are located at 602 Provident Bank Building, Cincinnati.

The Moltrup Steel Products Co., Beaver Falls, Pa., will increase its capital from $300,000 to $2,000,000. The concern advises that a large part of the increase will be used in making additions to its plant at Beaver Falls, plans for which are now being made, and will be definitely agreed upon in a short time. The company states it does not intend to take on any new lines of product.

The Standard Steel & Wire Co. has been incorporated with a capital of $40,000, fully paid in. It has established permanent offices in the Machinery Hall Building, 549 W. Washington Boulevard, with warehouse at 320 E. North Water Street, Chicago, and will act as direct mill representative, carrying a stock of hot-rolled and cold-finished steels, also steel specialties.

McClernan & Co., Peoples Gas Building, 122 South Michigan Avenue, Chicago, have been appointed exclusive representatives in the Chicago district for the Falcon Steel Co., manufacturer of black sheets, blue annealed sheets and galvanized sheets, with mills and general offices, Niles, Ohio. The Chicago territory comprises the northern half of Illinois, the northwestern portion of Indiana and the southern portion of Wisconsin.

Structural material for the plant of the newly formed Powell Pressed Steel Co. at Hubbard, Trumbull county, Ohio, has begun to arrive and erection of the superstructure will commence within a short time. Work now in progress consists in building piers to receive the steel work and for heavy presses. Production will start about June 1 and many orders have been taken.

Federal approval has been given to the fabrication of 100 additional steel containers for the Warrior river merchandise freight business. Ingalls Iron Works, Birmingham, is making them. Two steel self-propellers for the Warrior river will be launched in St. Louis April 19 and proceed to New Orleans for cargoes for Birmingport, near Birmingham. They have 2000 tons capacity.

The foundry business of M. D. Jones Co., Concord, Mass., has been incorporated under the firm name of the M. D. Jones Foundry Co., with a capital of $50,000. The plant is located at Concord Junction. Loring N. Fowler is president and Frederick G. Jones, treasurer.

More than 100 members of the Lehigh Chapter of the American Steel Treaters Society met in Bethlehem, Pa., last Friday as the guests of the Bethlehem Steel Co. There was an inspection of various departments of the steel company plant, luncheon at the company cafeteria, and the presentation of motion pictures of the steel plant in operation. J. E. Halbring, Ingersoll-Rand Co., Phillipsburg, is president of the society, and A. P. Spooner, Bethlehem Steel Co., secretary-treasurer.

The Covington Machine Co., Covington, Va., has recently been sold to new interests. Its plant has a well equipped machine shop and foundry and it manufactures coke drawing and loading machines and coal leveling machines for bee hive ovens; punches, shears, bending rolls and other equipment. The foundry produces gray iron castings up to 20 tons, also small brass castings. The officers are F. U. Humbert, president; F. W. King, vice-president; G. W. Lipscomb, secretary and treasurer, and E. H. Archer, manager.

To interest all districts that will benefit by the proposed Lake Erie-Ohio River canal, the Canal Board of the Youngstown, Ohio, Chamber of Commerce, with leading iron and steel executives as members, has developed a comprehensive program. It is definitely planned to have headquarters of the Canal Board at both the Republican and Democratic convention cities, and to induce both parties to have included in their platform an Inland Waterways plank.

Carl August Lausberg and his sons, William and Charles, are the incorporators of the C. A. Lausberg & Sons, Inc., wire manufacturer, capitalized at $100,000, with a plant at 349-351 Clinton Street, Paterson, N. J.

Erection of a fabricating plant and warehouse is planned by the Sheet Metal Mfg. Co., Youngstown, Ohio, which has increased its capital from $50,000 to $250,000.

The Mummert-Dixon Co., Hanover, Pa., manufacturer of portable radial grinders and facing heads, is now occupying its new pattern shop, which provides about 7000 sq. ft. of floor space. The shop is heated by two "pipeless" furnaces.

The National Brake & Electric Co., Milwaukee, has placed contracts for alterations and enlargement of its open-hearth buildings which will cost about $150,000. The work requires 300 tons of structural steel, placed with the Worden-Allen Co. Herman J. Esser, architect, 403 Camp Building, is supervising the project.

The Keystone Driller Co., Beaver Falls, Pa., is making some additions to its plant, including the installation of an electric furnace and the building of a new machine shop.

Falcon lodge of the Amalgamated Association of Iron, Steel and Tin Workers has been organized among employees of the Falcon Steel Co., Niles, O., with an initial membership of 85. Samuel Cartwright was chosen president.

The Iron Trade Products Co., Pittsburgh, has been appointed exclusive sales agent for the Connellsville-Fairmont Coal Co.'s mines at Worthington, W. Va., on the B. & O. Railroad, producing high-grade steam coals.

The Link-Belt Co., Chicago, has purchased the Fairmount foundry, Philadelphia, as an adjunct to its Eastern works in that city. It is also announced that a new administration building for the Chicago works is contemplated.

At the April meeting of the New England Foundrymen's Association, April 14, at the Exchange Club, Boston, W. R. Balch, Boston *Transcript*, spoke on "American Sleeping Sickness—Its Causes and Effects."

The Marshall, Mich., plant of the Flint Foundry Co. will immediately be expanded by the addition of two units at a cost of $75,000, according to C. F. Boyd, manager. One building will measure 70 x 200 ft. and the second 80 x 118 ft. These new facilities will permit an increase in the working force to 300.

Machinery Markets and News of the Works

RAILROADS BUYING

Orders Placed by Lehigh Valley, Maine Central and Nickel Plate

Business Is Fairly Good, but Tie-up of Transportation May Have Serious Effect

Despite the tie-up of transportation due to the "outlaw" strike, railroad buying of machine tools has been of some importance in the past week. The Lehigh Valley, which inquired in the East about a month ago for a list of tools, has placed orders for at least a part of its requirements; the Maine Central has bought tools at Boston, and the Nickel Plate has placed orders at Cleveland and elsewhere in the Central West. The New York Central has issued a few inquiries, the Erie Railroad, some of whose shops are now under private operation, has inquired for shop equipment.

Export trade shows improvement. At Cleveland an order has been placed for 30 turret lathes for Russia, but shipment will be deferred until the United States reestablishes commercial relations with the Soviet Government. Tools have been shipped to England and orders continue to come through in fair volume from Japan. Brazil has also been buying here. Inquiries at Cincinnati indicate that there will be good foreign buying when the exchange situation becomes more nearly normal.

Conditions in various domestic markets differ, but as a whole it may be said that business is much better than might be expected, considering the conditions which tend to hamper it. The railroad strike at Chicago has cut off all shipments of tools either from manufacturers' or dealers' stocks, and the transportation situation has also tended to restrict buying there. Washing machine manufacturers and other companies making household appliances have been fairly good buyers of tools in that market.

A fairly heavy volume of business was closed in Cleveland last week, including about 25 tools for the Ford tractor plant at Hamilton, Ohio. There was also a considerable number of single orders for machines. The Akron rubber companies are buying boring mills.

In the East business has been fair the past week, this applying to the New York and New England territories in particular. The Southworth Brothers Co., Amsterdam, N. Y., has issued a fair-sized list of machine-shop and foundry equipment. The General Electric Co. continues to buy for its Bridgeport, Conn., works.

There have been cancellations of machine tools, a round lot having been cancelled at Cleveland because of the inability of the buyer to complete additions to its plant as soon as expected. In the aggregate the cancellations have not been large enough to cause serious concern to the machine tool builders. Some further price advances are reported.

New York

NEW YORK, April 13.

Although business in machine tools was fairly good last week, it was apparent early this week that the tie-up of railroad transportation would have serious effect on business. Monday and to-day (Tuesday) there was very little inquiry, mails being delayed. Many machine-tool salesmen and managers had difficulty in reaching their offices. It is practically impossible to make freight shipments. Business in this district will undoubtedly suffer severely if the strike is of long duration.

Some railroad orders and inquiries are coming out, the New York Central having issued several inquiries for individual machines, and quotations have been asked for by the Erie Railroad shops, some of which are now under control of private corporations. The Lehigh Valley Railroad has placed orders for a part of the list of tools it inquired for about a month ago.

A fair-sized list has been issued by the Southworth Brothers Co., Amsterdam, N. Y., a textile manufacturer, for a machine shop, some 20 or more miscellaneous tools being required; also a cupola, blower and core oven for a foundry.

Shipbuilders are active and have bought quite a number of second-hand tools. In one instance a Canadian shipbuilding company asked that a large machine be shipped by express, so urgent was its need. The Merchants Shipbuilding Corporation, Bristol, Pa., has bought a few machines.

The General Electric Co. is placing orders for its Bridgeport, Conn., works.

Inquiry for overhead traveling cranes is light, the expected railroad purchasing not having as yet developed. Locomotive crane builders, however, report a good business, particularly in the Middle West. Several export inquiries have been issued recently. Among these is one offered by both Dowler, Forbes & Co., New York, and Jardine, Matheson & Co., New York, which includes three 20-ton, one 5-ton and one 3-ton, all 40-ft. span, overhead traveling cranes for Shanghai, China. The Marchand Export & Import Co., 220 West Forty-second Street, New York, is in the market for a scoop conveyor with a 4-hp. motor and Perin & Marshall, 2 Rector Street, for a pig breaker for a 250-ton blast furnace in China.

Among current inquiries are: The Phoenix Utilities Corporation, New York, a 15-ton, 29-ft. span gantry crane; the Equity Engineering Co., 30 Church Street, New York, a 5-ton hand power crane; the New York Municipal Railways Co., Brooklyn, N. Y., for the Brooklyn Rapid Transit, a 15-ton, 55-ft. span overhead traveling crane; the Chester Shipbuilding Co., Chester, Pa.; two cage control bridges, 7½-ton, 82-ft. 8-in. span and 5-ton, 58-ft. 4¾-in. span. The Interborough Rapid Transit Co., New York, the H. A. Mays Foundry Co., Philadelphia, and the American Steel Foundries, Chester, Pa., are in the market for overhead traveling cranes. Stone & Webster, New York, is inquiring for second-hand cranes for the American Sugar Refining Co.

Recent sales include: The Champion Engineering Co., a 15-ton, 30-ft. span overhead traveling crane to Riera, Toro & Von Twistern, New York, for export to Cuba, and a 130-ft., double cantilever, gantry crane to the Spicer Mfg. Co., South Plainfield, N. J.; the Northern Engineering Co., a 30-ton, 40-ft. span crane to the Brighton Mills, Passaic, N. J., for a power house at Allwood, and a 30-ton, overhead traveling crane to the Pennsylvania Pulp & Compressor Co., Easton, Pa.; the Brown Hoisting Machinery Co., three locomotive cranes with grab buckets and the Industrial Works three locomotive cranes with magnets to the Union Pacific Railroad for Oklahoma; the American Hoist & Derrick Co., a 20-ton locomotive crane to the International Coal Products Corporation, Newark, N. J.; and the Shepard Electric Crane & Hoist Co., two 2-ton, 38-ft. span, overhead traveling cranes to the Lycoming Foundry & Machine Co., Williamsport, Pa., and a 1-ton crane to the Landis Tool Co., Waynesboro, Pa.

The Cutler-Hammer Mfg. Co., 50 Church Street, New York, manufacturer of rheostats and other electrical con-

trolling devices, with headquarters at Milwaukee, Wis., has purchased the five-story factory at 137th Street and the Southern Boulevard from Winter & Co., piano manufacturers. The building comprises about 100,000 sq. ft., and will be used by the new owner for manufacturing purposes. Other property, with existing buildings at 739-745 East 137th Street, has also been acquired, and will be used in conjunction with the new works. The company is now operating a plant at 144th Street and the Southern Boulevard.

The Adams Steel Products Corporation, New York, has been incorporated with a capital of $50,000 by A. J. Adams, C. S. Galbraith and R. Loudon, 2 Rector Street, to manufacture iron and steel specialties.

The Elmira Foundry Co., Elmira, N. Y., has increased its capital stock from $300,000 to $1,000,000.

The Eastern United States Truck Corporation, New York, has been incorporated with a capital of $150,000 by S. McNamara, R. Tobery and William Annette, 344 West Seventy-second Street, to manufacture motor trucks and parts.

The George Haiss Mfg. Co., 141st Street and Rider Avenue, New York, manufacturer of portable wagon loaders, has had plans prepared for a one-story plant, 50 x 188 ft., on Park Avenue, near 141st Street, to cost about $20,000. The building will be erected by the Haiss Realty Co., an associated organization.

The International Heater Co., Park Avenue, Utica, N. Y., manufacturer of heating equipment, boilers, etc., has acquired the plant of the Utica Pipe Foundry Co., Dwyer, heretofore devoted to the manufacture of cast iron pipe. Improvements will be made in the works for occupancy by the new owner.

The Oxyhydrocarbon Heating Co., Rockville Centre, L. I., has been incorporated with a capital of $100,000 by A. L. Turner, W. L. Colt and J. G. Gerhard, 222 West Thirty-fourth Street, New York, to manufacture heating equipment.

The State Superintendent of Prisons, Albany, N. Y., has had plans prepared for a one-story industrial and machine works, 60 x 170 ft., to be located at the Great Meadow Prison, Comstock, N. Y. Lewis F. Pilcher, Capitol Building, is the architect.

The Jamaica Tire & Rubber Co., Flushing Avenue, Jamaica, L. I., manufacturer of tires, etc., has increased its capital stock to $200,000.

The Pocket Check Protector Corporation, New York, has been incorporated with a capital stock of $75,000 by E. Pinles, A. Goldstucker and W. K. Dupre, Jr., 20 Nassau Street, to manufacture special check protecting devices.

Forman & Oriner, Inc., Brooklyn, has been incorporated with a capital stock of $50,000 by H. and F. Lerner, and B. Forman, 856 East 178th Street, New York, to manufacture metal specialties.

The Peerless Unit Ventilation Co., 521 West Twenty-third Street, New York, manufacturer of ventilating equipment, has increased its capital stock from $25,000 to $100,000.

H. Wagner & Co., Inc., New York, has been incorporated with a capital stock of $10,000 by H. Wagner, W. Mitnick and L. Rook, 336 West 100th Street, to manufacture tools, machine parts, etc.

The Municipal Commission, Utica, N. Y., is having plans prepared for an addition to the municipal electric power plant, one story, 40 x 60 ft., to cost about $160,000, including equipment. Bonds for this amount have been voted.

The New York Edison Co., 130 East Fifteenth Street, New York, has completed plans for the erection of a two-story electric substation, 92 x 112 ft., on Inwood Avenue, near 170th Street, to cost about $250,000, including equipment.

Francis Kiel & Son, Inc., New York, has been incorporated with a capital stock of $1,000,000 by H. F. Kiel, F. A. Wurzbach and W. F. Timme, 593 Riverside Drive, to manufacture cutlery and hardware products.

The Watertown Engine & Machine Co., West Main Street, Watertown, N. Y., is planning for the erection of a one-story addition, 55 x 100 ft.

The Estate of H. A. Cram, 503 Fifth Avenue, New York, has filed plans for the erection of a new machine shop, 30 x 60 ft., at 24-26 East 136th Street, to cost about $7,000.

The Hercules Machine & Tool Co., New York, has been incorporated with a capital stock of $100,000 by H. J. Rosenkranz, M. G. Himoff and D. Singer, 410 Broome Street, to manufacture machinery and tools.

The H. W. Johns-Manville Co., Madison Avenue and Forty-first Street, New York, manufacturer of brake lining, roofing, asbestos products, etc., has awarded a contract to the John W. Ferguson Co., Paterson, N. J., for a one-story brick addition to its plant at Manville, N. J., 151 x 641 ft.

The Fahnestock Electric Co., Meadow Street, Long Island City, manufacturer of electrical products, has awarded contract to C. Curtis Woodruff & Co., 213 Tenth Street, Long Island City, for a two-story reinforced concrete plant, 50 x 100 ft., at East Avenue and Eighth Street, to cost about $50,000.

The Utica Compressor Co., Utica, N. Y., has been incorporated with a capital of $30,000 by S. B. Hemstrought, F. E. Beck and C. A. Schmidt, to manufacture compressors and other mechanical equipment.

The Scott Rubber Co., Poughkeepsie, N. Y., has been incorporated with a capital stock of $125,000 by H. D. E. Scott, H. W. Palen and G. L. Kerr, 790 Riverside Drive, to manufacture rubber products.

The Automatic Switch Co. has leased property at 154 Grand Street, New York, for the establishment of local works.

The Dictograph Products Corporation, 220 West Forty-second Street, New York, manufacturer of electric-operated recording devices, has awarded contract to the Barney Ahlers Co., 110 West Fortieth Street, for a two-story plant on Schooley Street, near Chichester Avenue, 30 x 137 ft., to cost about $25,000.

The United States Auto Lamp Mfg. Co., Brooklyn, has been organized by H. Sherman and M. Brook, 580 Essex Street, to manufacture metal automobile lamps.

The Chamberlain Metal Weatherstrip Co., 47 West Thirty-fourth Street, New York, with plant at Detroit, Mich., has leased property at 129 East Fifty-eighth Street, for new works.

The Spicer Mfg. Corporation, South Plainfield, N. J., manufacturer of universal joints, frames and axles for automobiles, has arranged for a stock issue to aggregate about $1,740,000. The company also operates the Parish Mfg. Co., and the Sheldon Axle & Spring Co., with plants at Reading and Wilkes-Barre, Pa. A portion of the proceeds from the securities will be used for expansion.

Hart & Co., Inc., Paterson, N. J., has been incorporated with a capital stock of $100,000 by C. Frank Hart and W. Franklin White, to manufacture hardware specialties.

The General Electric Co., Edison Lamp Works, Harrison, N. J., has acquired the plant of L. Feuchtwanger & Co., Little Ferry, near Hackensack, N. J., with manufacturing space totaling about 35,000 sq. ft. The works have been used for the manufacture of chemicals and will be remodeled to accommodate the new line of production.

Jenkins Brothers, Inc., 80 White Street, New York, a New Jersey corporation, manufacturer of valves, mechanical packing, etc., has increased its capital stock from $750,000 to $5,000,000. Its main plant is at Elmira, N. Y.

The American Motors Corporation, West Front Street, Plainfield, N. J., manufacturer of automobiles, has organized the Plainfield Body Corporation, with capital stock of $250,000, to manufacture automobile bodies to be used at the local plant, as well as at the company's branch works at Greensboro, N. C. Arrangements have been made to occupy a portion of the plant of the parent company, pending the erection of a building for this branch of the business. Plans for the proposed works are being prepared to provide an initial space of about 40,000 sq. ft. The output will be about 7000 bodies per year and for the present production will be restricted to touring car and roadster bodies. Robert Bursner is president of the Plainfield Body Corporation, and Guy Morgan, vice-president and general manager. Hiram F. Brown will be in charge of factory operations.

The Driver-Harris Co., Harrison, N. J., manufacturer of wire for electrical service, metal rope, etc., has construction under way on a three-story addition, 50 x 100 ft., with 100 ft. wing. Contract for another extension has been awarded to the John W. Ferguson Co., Paterson, N. J.

The International Motor Truck Co., West Front Street, Plainfield, N. J., has arranged for an increase in its capital stock, to aggregate about $7,000,000.

The Saurer Motor Co., Plainfield, N. J., manufacturer of motor trucks, has filed notice of change of name to the International Plainfield Motor Co.

The Simmons Co., Brunswick Avenue, Elizabeth, N. J., manufacturer of metal beds, has arranged for the erection of an addition to cost in excess of $100,000.

The Arrow Motor & Machine Co., 397 Market Street, Newark, N. J., has completed plans for its new plant at 727 Frelinghuysen Avenue. It will be one and two stories, 70 x 100 ft. and 20 x 70 ft. respectively, and is estimated to cost about $60,000.

The Edward F. Terry Mfg. Co., Grand Central Terminal, New York, manufacturer of cranes, derricks, etc., with plant

on Passaic Avenue, Kearny, N. J., has increased its capital stock from $400,000 to $900,000.

The General Lead Batteries Co., 4 Lister Avenue, Newark, manufacturer of storage batteries, is completing plans for a five-story brick and steel plant at Lister Avenue and Chabot Street, estimated to cost about $150,000.

The Larchmont Motors Corporation, Newark, has been incorporated in Delaware with capital of $5,000,000 by Walter H. Shimpf, Newark; George O. Starr and Arthur W. Baldwin, East Orange, N. J., to manufacture automobiles.

Krementz & Co., 49 Chestnut Street, Newark, manufacturer of gold plated jewelry specialties, has leased property at Oliver and Mulberry streets for the establishment of a branch plant. The company has been considering the erection of a new plant on Chestnut Street, but it is said that this project will be deferred for a time.

The H. E. Smith Co., 5 Oliver Street, Newark, manufacturer of duplicator parts, supplies, etc., has acquired property on South Fifteenth Street, near Central Avenue, 100 x 100 ft., for the erection of a new plant.

The Cook Electric Co., Jelliff Avenue and Runyon Street, Newark, recently incorporated with a capital stock of $25,000 to manufacture electrical specialties, is having plans prepared by H. D. Scudder, Jr., 9 Clinton Street, for a one-story plant, 22 x 95 ft.

The Submarine Boat Corporation, Port Newark, Newark, has been reducing its working force, dismissing a total in excess of 2000 men, with arrangements to operate the plant for steel vessel construction for private interests. It is said that the reduction will continue until the force has been reorganized at about 50 per cent of that formerly employed. Operations are also to be established on a 60-cent hour basis.

The DeCozen Motor Car Co., Broad and Miller streets, Newark, has filed plans for a two-story service building and repair works, 104 x 235 ft., to cost about $75,000, adjoining its present buildings. Other extensions have recently been made and when completed the works will occupy the entire block bounded by Broad, Vanderpool and Miller streets and New Jersey Railroad Avenue.

The Superior Auto Radiator Works, 11 Sixteenth Avenue, Newark, have filed notice of organization to manufacture automobile radiators and similar metal specialties. Michael Silverman, 493 Clinton Avenue, heads the company.

Barnet Burstein, 694 South Fifteenth Street, Newark, operating a motor bus works for parts manufacture, repairs, etc., has filed plans for a one-story addition, 51 x 106 ft., to cost about $14,000.

New England

BOSTON, April 12.

Machine tool buying continues on a satisfactory scale. So far this year the leading houses have sold considerably more light equipment than during the corresponding period last year and decidedly more than in the same period in 1917. Sales of heavy equipment so far this year have been larger than in 1919, but considerably under the 1917 showing. The falling off in this line is natural, however, as New England is a light equipment field. Most of the local smaller tool concerns or representatives so far this year have had the largest business on record.

With possibly three or four exceptions, individual orders placed the past week have been for single or two or three tools, but the aggregate has been quite large. The General Electric Co. continues the most important prospective buyer. Within a few days it will close on considerable miscellaneous equipment, but purchases will not be as large as anticipated because its appropriation has been materially cut. It is understood, however, that the full list issued earlier in the year will be bought before the close of 1920.

Further advances in tool prices are reported. One leading interest making a general line of machine tools marked its quotations up 10 per cent. The slight improvement in deliveries has not held, shipments having slowed up considerably the past week. A contributing factor, however, is the oversold condition of the motor market. Two of the largest manufacturers can make fairly satisfactory deliveries on anything under 1-hp., but on larger motors about the best that can be obtained is November shipment, and then only for small lots. Deliveries on large lots of motors extend into April, 1921. Single phase motors are especially difficult to obtain, six months being about the best that can be done. A slight advance in prices is expected in the near future.

The Maine Central Railroad has practically covered its list, having bought shapers, heavy duty drilling machines, lathes, pipe machines, flanging clamps and miscellaneous equipment. A. Hankey & Co., Rochdale, Mass., knife manufacturers, etc., who recently acquired the Rogers drop forging plant, Worcester, Mass., has bought several steam hammers, presses and miscellaneous die making equipment and is in the market for a 30-in. 8-ft. or 10-ft. lathe. It is now engaged in making automobile gears for differentials and transmissions. The Jaquith Machinery Bureau, Inc., Boston, bought machine shop equipment, and a Woonsocket, R. I., interest is equipping its plant for the manufacture of automobile grease cups. The Gilbert & Barker Mfg. Co., Springfield, Mass., continues to take odd machines. The Henry & Wright Mfg. Co., Hartford, Conn., machinery, has closed on considerable new equipment. Several schools have figured in recent tool sales, including the Brookline High School, which bought lathes and other equipment. The Northway Motors Co., Boston, is reported in the market for considerable equipment, and a representative of V. Cundasawmy Naicker, India, is inquiring for prices and catalogs on lathes, drilling and screw machines, planers and shapers. The Saco-Lowell Works still has inquiries out on miscellaneous tools, and has been conspicuous in the past week's purchases. J. Briggs & Sons Co., Providence, R. I., is in the market for a 14-in. change gear lathe, and the Lumber Products Co., 70 Main Street, Auburn, Me., is buying lathes for its new plant. A Pawtucket, R. I., company is about to close on several lathes, also a Boston candy manufacturer and the Crompton & Knowles Loom Works, Worcester, Mass. An Eastern railroad supply house is interested in a large lathe and probably will place the order within a few days.

Activity in new machines is reflected in the second-hand market. The inability of manufacturers to make prompt deliveries on new equipment has obliged many consumers to enter the used tool market and good sales are reported. Considerable local interest is shown in the liquidation of all war plant machine tool equipment by the American Can Co. at Geneva, N. Y., on April 27; Kenilworth, N. J., April 28, and Edgewater, N. J., April 29 and 30. The high school, Brookline, Mass., has machine shop blowers, fans, etc., for sale.

The Jaquith Machinery Bureau, Inc., which some time ago sold its machine shop equipment and lease at 77-79 North Washington Street, Boston, to the Petroleum Heat & Power Co., Boston, will establish a new shop in the near future. Temporary quarters are at 148 Pearl Street. The company designs and builds special machinery and tools, mechanical and electrical devices and laboratory apparatus, in addition to making models and doing experimental and general fine machine work. A. S. Jaquith is president and treasurer.

The Goodyear Rubber Co. will erect a three-story plant, 50 x 216 ft., at Middletown, Conn., to cost about $144,000.

Work will soon start on a new three-story manufacturing building for the Osgood-Bradley Car Co., Worcester, Mass., to cost approximately $350,000.

The King Pressed Steel & Mfg. Co., Inc., Newton, Mass., with a capital stock of $50,000, was recently chartered to manufacture automobile accessories and tools. It is occupying small quarters at 448 Watertown Street, but about May 1 expects to move into a plant under construction at 13 Hawthorn Street. It is also the intention to do light and medium metal stamping, assembling and enameling. Joseph F. King is president and A. Pescosolido, treasurer.

Gray & Davis, Inc., Cambridge, Mass. automotive equipment, has received an order in excess of $700,000 from its French correspondent and has closed a large contract for starting and lighting systems from a Middle West low-priced automobile manufacturer. Additional contracts make it necessary for the company to increase its output to 800 systems per day.

The Worcester Wire Works, Inc., Ludlow Street, Worcester, Mass., will erect a one-story frame building, 45 x 143 ft., for manufacturing purposes.

The Carlisle Tire Corporation, 200 West Fifty-fourth Street, New York, will build a six-story plant, 60 x 215 ft., with wing, 30 x 60 ft., at Stamford, Conn., in the next few months.

In addition to the manufacturing building, 90 x 100 ft., about to be erected by Harvey Hubbell, Inc., Bridgeport, Conn., manufacturer of guards, electric lamps, reflectors and switches, it contemplates the erection of another structure on State Street, near its present plant.

The Osgood-Bradley Car Co., West Boylston Street, Worcester, Mass., manufacturer of electric cars, etc., has completed plans for a three-story, brick and concrete addition, to cost about $300,000, including equipment.

The Erwin M. Jennings Co., Bridgeport, Conn., operating a general machine works for automobile repairs and other operations, has increased its capital stock from $100,000 to $500,000.

The Hartford Tap & Gauge Co., Hartford, Conn., has been incorporated with a capital stock of $50,000 by H. M.

W. Hanson, 122 Tremont Street, H. M. Flynn, and H. B. Carey, to manufacture tools, gages, dies, etc.

Fire, April 2, destroyed a portion of the plant of the Ruggles Machine Co., Poultney, Vt., with loss estimated at about $50,000.

The Peck Spring Co., Plainville, Conn., manufacturer of springs, etc., is considering the erection of a one-story brick addition to cost about $25,000.

The Rhode Island Malleable Iron Works, Hillsgrove, R. I., has awarded contract to Carl E. Carlson, 66 Congress Avenue, Providence, for two one-story additions, 56 x 88 ft., and 28 x 72 ft., to foundries Nos. 1 and 2, respectively.

The Fitzgerald Mfg. Co., Torrington, Conn., manufacturer of automobile equipment, has increased its capital stock from $250,000 to $500,000.

The Bertelsen & Peterson Engineering Co., 256 Border Street, Boston, Mass., is considering plans for the erection of a ship repair plant on a local site. The initial works are estimated to cost about $50,000.

The New Metal Tool Steel Co., 185 Thames Street, New London, Conn., has been organized to manufacture tool steel products. A. C. Bellefleur heads the company.

The C. H. Grimm Co., Rutland, Vt., manufacturer of evaporator equipment, has awarded a contract to F. H. Remington, Meade Building, for a brick addition to cost about $50,000.

The Modern Mfg. Co., Bridgeport, Conn., manufacturer of tools, jigs, etc., has filed notice of dissolution.

The J. N. Lapointe Co., New London, Conn., manufacturer of broaching machines and broaches, has awarded a contract to H. R. Douglas & Son, New London, for a one-story machine shop, 32 x 114 ft., to cost about $20,000.

The Prest-O-Lite Co., 30 East Forty-second Street, New York, manufacturer of acetylene equipment, with main plant at Indianapoliis, is having plans prepared for a one-story branch works at Cambridge, Mass., 25 x 100 ft., to cost about $80,000.

The Hood Rubber Co., 10 High Street, Boston, Mass., manufacturer of automobile tires with plant at Watertown, has increased its capital stock from $3,500,000 to $5,500,000.

The Hartford Metal Treating Co., Hartford, Conn., has filed notice of dissolution.

The Stratford Body Co., Stratford, Conn., specializing in the manufacture of motor bus bodies, is planning for the erection of an addition to double approximately the present output, construction to start within the next few months. Plans are being prepared for the installation of equipment at its power plant to change from steam to electric operation.

C. N. Flagg, Inc., 27 State Street, Meriden, Conn., manufacturer of steam heating equipment, is having plans prepared for a one- and two-story factory, 40 x 120 ft., on Griswold Street, to cost about $35,000.

The United Illuminating Co., Grand Avenue, New Haven, Conn., has had plans prepared for the erection of an addition to its power plant to cost about $50,000. New boilers and other equipment will be installed.

The Dowd-Rodgers Co., Carleton Street, Wallingford, Conn., manufacturer of plated ware, metal novelties, etc., is planning for the erection of a three-story addition, 50 x 100 ft., on South Cherry Street.

The Wico Electric Co., Chestnut and Liberty streets, Springfield, Mass., formerly the Witherbee Igniter Co., and recently incorporated under Massachusetts laws with a capital stock of $400,000 to manufacture magnetos, storage batteries, ignition equipment and specialties, has bought seven acres in West Springfield for $18,000, on which a plant to cost $150,000 will be erected. The company employs 300, but will increase this number to about 1500 when the new plant is completed. Phelps Brown, 44 Avon Place, is president; Arthur W. Lamson, vice-president, and Edward L. Stoughton, treasurer.

Philadelphia

PHILADELPHIA, April 12.

The H. A. May Foundry Co., Sixty-first Street and Eastwick Avenue, Philadelphia, manufacturer of iron and steel castings, has acquired a one-acre site on Walnut Street, between Thirtieth and Thirty-first streets, for a consideration of about $125,000, and plans are being prepared for a new six-story, reinforced-concrete plant. Peuckert & Wunder, 310 Chestnut Street, are the architects.

Fire, April 5, destroyed a portion of the graphite works of the T. P. Kelly Co., Stockertown, near Easton, Pa., with loss estimated in excess of $100,000.

The Fox Motor Car Co., Philadelphia, has acquired property near the Tabor Station of the Philadelphia & Reading Railroad, and is having plans prepared for a three-story plant, of reinforced-concrete, 80 x 400 ft., as a first unit of a works for the manufacture of motor car parts.

The Pennsylvania Railroad, Broad Street Station, Philadelphia, has arranged for a bond issue of $50,000,000, a considerable portion of the proceeds to be used for extensions and betterments in shops and mechanical equipment. Among the projects planned is the erection of new shops at Marietta, Pa., to cost in excess of $2,000,000.

The Commercial Truck Co. of America, Twenty-seventh and Brown streets, Philadelphia, manufacturer of automobile trucks, has acquired property at Third and Luzerne streets, aggregating about 42 acres, for the erection of a new plant. Plans have been completed for two buildings to form the initial units of the new works.

The Ford & Kendig Co., 1428 Callowhill Street, Philadelphia, manufacturer of pipes and tubing, steam supplies, etc., has filed plans for a two-story building, 100 x 270 ft., at Twenty-fourth and Wood streets, to cost about $30,000.

Fire, April 7, originating in the boiler plant of the Keystone Woodenware Co., 617-21 Reed Street, Philadelphia, destroyed a portion of the works with loss estimated at $50,000.

The Independent Foundry & Machine Co., Punxsutawney, Pa., has been incorporated with a capital of $25,000 to manufacture iron and steel castings. G. Frank Porter is treasurer.

The building to be erected by the Philadelphia Storage Battery Co., Ontario and C streets, Philadelphia, to replace a recent fire loss, will be three stories, 100 x 130 ft., and will cost about $60,000, instead of $35,000, as previously announced.

The Keystone Automobile Top Co., 1412 Fairmount Street, Philadelphia, is taking bids for a four-story plant, 80 x 140 ft., at Fairmount and Seventeenth streets.

The Wicaco Screw & Machine Works, Inc., Seventh and Wood streets, Philadelphia, has awarded a contract to Barclay White & Co., 1713 Sansom Street, for a one-story machine shop on Stenton Street, 82 x 157 ft., to cost about $80,000, including equipment. A three-story office building will also be constructed.

The Niles-Bement-Pond Co., Twenty-first and Callowhill streets, Philadelphia, manufacturer of machine tools, cranes, etc., has arranged for the establishment of a new plant in Chile, for the manufacture of small arms.

The Prest-O-Lite Co., 30 East Forty-second Street, New York, manufacturer of acetylene apparatus, is having plans prepared for a new one-story plant at Philadelphia, 25 x 100 ft., to cost about $80,000.

The Allison Steel Products Co., Chester, Pa., recently incorporated to manufacture metal sash, doors, etc., is considering plans for a one-story steel and concrete plant, 62 x 200 ft., on Second Street, near Palmer Street, to cost about $50,000. The company is affiliated with Allison & Co., Law Building, Chester, manufacturers of forgings and castings, anchors, etc.

A one-story machine shop, engine plant, carbonizing works and other mechanical buildings will be erected by Eavenson & Levering, Camden, N. J., at their wool combing and scouring and combing works on Atlantic Avenue. The new buildings with equipment will cost about $500,000.

The Packard Motor Car Co., Camden, N. J., is having plans prepared for a one-story brick and concrete service building and repair works, 72 x 185 ft.

The Nearpara Rubber Co., North Olden Avenue and Prince Street, Trenton, N. J., has awarded a contract to the Bethlehem Construction Co., Bethlehem, Pa., for the rebuilding of its rubber reclaiming plant recently destroyed by fire. The structures will comprise a main one-story works, 100 x 125 ft., and power plant, 30 x 30 ft., to cost about $150,000.

The Schwartz Motor Truck Corporation, 522 Chestnut Street, Reading, Pa., manufacturer of automobile trucks, has acquired about five acres at Oakbrook, a suburb of the city, as a site for a new plant. Plans are being prepared for a one and two-story works, to cost about $250,000.

The Victor Tool Co., Waynesboro, Pa., is planning for the immediate erection of a one-story addition, 60 x 125 ft. It specializes in the manufacture of vises, tools, taps, etc.

The United States Axle Co., Pottstown, Pa., recently organized, has taken over the local plant of the Industrial Foundry & Machine Co., which it will use for the production of automobile axles. George C. Lees is president and L. E. Orgill, secretary-treasurer.

A three-story boiler plant, 53 x 108 ft., will be erected by the Viscose Co., Marcus Hook, Pa., at its local works.

The International Motor Co., Allentown, Pa., manufacturer of motor trucks, is planning for the occupancy of its new machine and mechanical shops, now in course of erection, early in June. Considerable equipment in use

other shops of the plant will be removed to the new building. With the current demand for its output, the company has tentative plans under consideration for a 600-ft. addition to the new shop later in the year. L. J. Holmes is manager.

Alfred Box & Co., Inc., Philadelphia, is in the market for a No. 2 Cincinnati or equivalent universal tool room grinder; gear hobbing machine, similar to a Farwell No. 3; 36-in. horizontal disk grinder, Besley or Gardner; horizontal keyway cutter with routing attachment, capacity 6-in. in diameter, and a 36-in. Bullard rapid production boring mill.

Buffalo

BUFFALO, April 12.

The Harvey-Hanes Machine Corporation, Buffalo, recently incorporated, has purchased a factory at 308-314 The Terrace, where it will manufacture automatic machinery and the Ideal trolley wheel, of bronze and steel. Lawrence E. Harmon is manager.

Scott & Harmon, Buffalo, manufacturers of advertising thermometers, have secured space in the Harvey-Hanes Machine Corporation's building at 308-314 The Terrace.

The Monroe Motor Car Co., Buffalo, has let contract to the George W. Butler Co., Ellicott Square Building, for a service station, repair shop, and salesroom, 100 x 166 ft., two stories, at Main Street and Lafayette Avenue, to cost $125,000.

The Rand Co., North Tonawanda, N. Y., is taking bids for the erection of an addition, 60 x 200 ft., two stories, on Grundry Street.

The Farrel Foundry & Machine Co., 344 Vulcan Street, Buffalo, has awarded a contract to Huntley & Derdenger, for the erection of a one-story forge shop at its recently acquired works, 55 x 75 ft., to cost about $15,000. It specializes in the manufacture of chilled and gray iron rolls, rubber mill machinery, etc., with headquarters at Ansonia, Conn.

The Globe Woven Belting Co., 1396 Clinton Street, Buffalo, has increased its capital stock from $100,000 to $250,000 and is planning for the erection of an addition to cost about $15,000.

The Interlocking Reinforced Concrete Corporation, East Ferry Street, Buffalo, has arranged for the erection of a new one-story plant, 125 x 600 ft., to cost about $25,000.

Joseph T. Ryerson & Son, Chicago, have awarded contract to the John W. Cowper Co., for the erection of an addition to the plant on Bailey Avenue, Buffalo, recently acquired from the Ferguson Steel & Iron Co. The new building will be of brick and steel, 126 x 270 ft., and is estimated to cost about $250,000.

The Die Molding Production Co., Canastota, N. Y., has been incorporated with a capital stock of $12,000 by D. H. and W. F. Dew, and J. B. Holden, to manufacture metal specialties.

The Riverside Paper & Pulp Corporation, Rochester, N. Y., has acquired the former plant of the Porter Fibre Bottle Co., Lewiston, N. Y., for the establishment of a branch factory.

The Dual Tractor Co., Rochester, manufacturer of tractor parts, etc., has increased its capital stock from $10,000 to $100,000.

The Rochester Scientific Heat Corporation, Rochester, has been incorporated with a capital of $30,000 by I. Saunders, B. F. Cooper and C. P. Williams, to manufacture heating equipment.

The Kam-Kaderbeck Co., Inc., 967 Main Street, Buffalo, has arranged for the erection of a two-story service building at 1118-24 Main Street, to be provided with machine shop, parts department, etc.

The Hays Mfg. Co., Twelfth and Liberty streets, Erie, Pa., manufacturer of brass and bronze products, saw bands, etc., is taking bids for a two-story addition, 55 x 115 ft., at Twelfth and Peach streets, to cost about $75,000.

The Boggs Potato Grader Co., Atlanta, N. Y., manufacturer of agricultural implements, has increased its capital stock from $100,000 to $2,000,000.

The Diefendorf Gear Corporation, Syracuse, N. Y., has been incorporated with a capital of $150,000 by W. H. and M. A. Diefendorf, and W. F. Canough, to manufacture gears and other metal products.

The Yawman & Erbe Mfg. Co., 424 St. Paul Street, Rochester, manufacturer of metal filing cabinets, safes etc., has increased its capital stock from $1,500,000 to $3,000,000 and has arranged for the erection of a three-story and basement addition, 137 x 250 ft., to cost about $400,000. Gustave Erbe is treasurer.

Baltimore

BALTIMORE, April 12.

Reus Brothers, Inc., 146 West Mount Royal Avenue, Baltimore, machinist, has awarded contract for a brick building, 100 x 200 ft., at Thomas Lane and the Western Maryland Railway to cost $40,000, to the Consolidated Engineering Co., Calvert Building. It will be used for the manufacture of piston rings, etc.

The Builders' Mill & Hardware Co., 3253 Frederick Avenue, Baltimore, has been incorporated with 20,000 capital stock to manufacture builders' supplies, automobile accessories, etc. The incorporators are Clement S., Maurice, E. and R. Lee Green and Robert G. Hopkins.

The plant of the W. G. Sigler Planing Mills, Luke, Md., was destroyed by fire April 6 with loss estimated at $50,000.

The Spann Motor Co., Philadelphia and Ellwood avenues, Baltimore, will build a garage, 150 x 170 ft., and install machinery for repair work. Prices are wanted on equipment. C. A. Spann is president and manager.

The Bandiere-Manuel Motor Co., 225 South Highland Avenue, Baltimore, has been organized and will erect an addition, 30 x 115 ft., to an existing building. Considerable machinery will be installed. J. R. Manuel is president, and C. M. Bandiere secretary and treasurer.

The Maryland Metal Crosstie Co., Munsey Building, Baltimore, and Havre de Grace, Md., is considering the establishment of plants in several places for the manufacture of metal crossties for use on railroads. A. F. Brown, Munsey Building, is president.

Quotations on second-hand machine tools are requested by R. R. Harrell, 107 Grace Street, Suffolk, Va. Prices are wanted particularly on engine lathes, shapers, drills and milling machines.

The Strickland Machine Co., Richmond, Va., of which Edward Whitlock is president, has increased its capital stock to $50,000.

The Cherryville Foundry Co., Cherryville, N. C., wants prices on cupolas. C. C. Dellinger is manager.

The Eagle Roofing & Art Metal Works, Tampa, Fla., will build a one-story plant, 123 x 143 ft., to cost $25,000 and will install electric-power equipment.

The Liberty Tool Mfg. Co., Baltimore, has acquired a large part of the property of the Rupp Tool Mfg. Co., Hagerstown, Md., and will establish a plant for the manufacture of tools, metal parts, etc. The Rupp company will continue in business in this section.

The Baltimore Boiler Scaling & Ship Cleaning Co., 908 South Broadway, Baltimore, has filed notice of change of name to the Marine Service Corporation. Clarence B. Gore is president.

The Ordnance Department, Washington, D. C., has acquired about 20 acres adjoining its plant at Camp Holabird, vicinity of Baltimore, Md., and is said to be arranging for the erection of additions to the machine shops.

The Campbell Metal Window Corporation, Scott and McHenry streets, Baltimore, recently incorporated with a capital stock of $2,100,000 to manufacture metal sash, will be affiliated with the Bartlett Hayward Co. of this city, Howard Bruce heading both organizations. The company has designated A. G. Ilich, 8 West Fortieth Street, New York, as its representative in this city.

The Grant Quick Ice Machine Co., Jacksonville, Fla., has been incorporated with a capital stock of $200,000 by W. C. Grant, J. S. Grant and C. V. Royster to manufacture ice-making machinery.

The Florida Phosphate Terminal Co., Fernandina, Fla., will install considerable mechanical equipment at its new shipping plant on the waterfront, including crushing machinery, drying apparatus, cranes and loading machinery, electric-driven cars, conveying apparatus, etc. A power plant will also be established. Charles E. Waddell, Asheville, N. C., is engineer in charge.

The Amesbury Mfg. Co., St. Petersburg, Fla., has been incorporated with a capital stock of $20,000 by C. H. Prescott, B. S. Wright and E. B. Holcomb, to manufacture automobile truck bodies.

The Master Auto Service Co., Greensboro, N. C., is having plans prepared for a two-story service building and repair works, 55 x 150 ft., to cost about $50,000.

The Eagle Roofing & Art Metal Works, 205 Cass Street, Tampa, Fla., manufacturer of metal specialties, is planning for the immediate erection of a one-story plant, 125 x 140 ft., to cost about $25,000. Alexander Szabo is manager.

The Harrisonburg Motor Co., Harrisonburg, Va., will build a new service and repair works on West Market Street, to cost about $60,000. A building now on the site is being razed for the new structure.

The Rappahannock Electric Light & Power Co., Fredericksburg, Va., will build an addition to its steam-electric generating plant, 40 x 120 ft., to cost about $35,000. E. C. L. Ficklen is treasurer.

The Westbrook Elevator Co., Danville, Va., is planning to rebuild its two-story plant on Spring Street, recently destroyed by fire. The new structure will cost about $30,000.

Chicago

CHICAGO, April 12.

The strike of railroad switchmen has not only cut off deliveries from manufacturers but shipments out of stock. One local dealer has resorted to the use of a motor truck for the delivery of machines to points within a reasonable radius of this city. The transportation situation has introduced an element of uncertainty in the market which tends to restrict buying, but the general labor unrest of which the railroad strike is only one phase, constitutes a much more serious limitation on current business. Although there is no doubt that many users of tools are postponing purchases because of the fear of strikes and the shortage of labor, the volume of orders being placed is all the more surprising. Some industries are still exceedingly busy and are buying in proportion to their needs. Notable among these are washing machine manufacturers and plants engaged in making other household appurtenances. The Altorfer Brothers Co., manufacturer of washing machines, Peoria, Ill., recently purchased four turret lathes, a number of gear cutters, shapers, multiple drills and a multimatic. The Mann Corporation, Bradley, Ill., recently received a contract for the manufacture of 10,000 laundry mangles and an option for the manufacture of as many more. This company has bought about $10,000 worth of machine tool equipment, including a 24-in. x 8-ft. Ingersoll milling machine, a number of smaller milling machines and drill presses. The Addressograph Co., 901 West Van Buren Street, Chicago, has purchased $50,000 worth of tools, including a 24-in. x 24-in. x 6-ft. planer, heavy floor grinder, a number of upright drills with tapping attachments and several vertical rotary milling machines. It also expects to buy a 100-lb. drop hammer and an 8-in. rotary surface grinder.

The International Harvester Co. continues to buy machines, although the individual orders are small.

Sales totals for March are larger than were expected. One dealer, in fact, booked more business than in any other month in his history. Although the market is by no means slow at present, it does not seem to be as active as earlier in the year.

Local construction work is moving at an encouraging rate. Permits were issued in March for 480 buildings, fronting 17,745 ft., involving a total cost of $10,600,100, as against 497 buildings, 14,745 ft. of frontage and $5,501,850 for the same month a year ago.

The Casey-Hudson Co., manufacturer of screw machine products, 361 East Ohio Street, Chicago, is receiving bids through Ernest A. Mayo, 53 West Jackson Boulevard, on a one- and two-story L-shaped plant, 300 x 300 ft., between North and Grand avenues on North Central Avenue, at an estimated cost of $300,000.

The Home Stove Works, 2606 West Eighteenth Street, Chicago, is taking bids through Paul F. Olsen, 127 North Dearborn Street, on a one-story foundry, 65 x 165 ft., to be built on the southeast corner of Eighteenth Place and Washtenaw Avenue, at a cost of $75,000.

The Arthur Jones Electrical Co., manufacturer of automobile and electrical equipment, 2837 South State Street, Chicago, is having new plans drawn for a $60,000 plant to be built on a 125 x 125-ft. tract at Calumet Avenue and Twenty-ninth Place.

The Bell & Howell Co., manufacturer of motion picture machinery, 1801-07 Larchmont Avenue, Chicago, will receive bids through an architect on a three-story addition, 50 x 105 ft., to cost $50,000.

The Hendricksen Motor Truck Co., 3538 Wabash Avenue, Chicago, has let contract for a one-story plant, 49 x 83 ft., at 18-24 East Thirty-sixth Street to cost $15,000.

The Elliott Foundry & Machine Works, 1921 South Fairfield Avenue, Chicago, has let contract for a one-story foundry, 46 x 250 ft., at 3311 South Ridgeway Avenue to cost $30,000.

The Block Mfg. Co., 1210 West Lake Street, Chicago, has let contracts for a two-story metal goods factory, 95 x 111 ft., to be built at 1751-57 Fulton Street at a cost of $75,000.

The W. D. Smith Silver Co., 5 South Wabash Avenue, Chicago, has let contracts for the erection of a one-story silversmith shop, 80 x 125 ft., at 4540-50 Fulton Street, to cost $40,000.

The Chatsworth Mfg. Co., Dwight, Ill., manufacturer of metal meat smokers and other metal products, will erect a new plant, 50 x 170 ft.

The Nu-Way Mfg. Co., Kewanee, Ill., manufacturer of wagon boxes and farm gates, has been reorganized with $25,000 capital stock, and will remove to Geneseo, Ill., where a factory site has been secured and construction will soon be under way.

The Minneapolis Steel & Machinery Co., Minneapolis, Minn., has bought part of the Longfellow public school site at Lake Street and Twenty-seventh Avenue, South.

The Griffith Foundry Co., Griffith, Ind., recently incorporated with $150,000 capital stock, is remodeling the buildings of the Griffith Mfg. & Supply Co. for its own use. It will manufacture light gray iron castings. The officers include Harry C. Stuart, president; Frank C. Wackewicz, vice-president; and C. F. Holt, secretary-treasurer.

The Zonta Tire & Rubber Co. has commenced the construction of a $150,000 plant at Leeds, near Sioux City, Iowa.

The Free Sewing Machine Co., Eighteenth Avenue and Thirteenth Street, Rockford, Ill., will build a new foundry, 90 x 100 ft., to cost $19,500.

The Rockford Tool Co., Twenty-fourth Avenue and Eleventh Street, Rockford, Ill., will build a one-story addition, 32 x 373 ft., to cost $15,000.

The Kewanee Boiler Co., Kewanee, Ill., will soon commence the construction of a foundry and tank shop to cost $500,000.

The Olive Can Co., 1232 Clybourn Avenue, Chicago, is taking bids for the erection of a two-story and basement plant, 48 x 120 ft., at 452 North Leavitt Street, to cost about $65,000.

The United Iron Works, Inc., Chicago, has arranged for an increase in its outstanding stock to $1,500,000.

The Columbia Scale Co., 2438 North Crawford Avenue, Chicago, is taking bids for the erection of a one-story plant at Twenty-fifth Street and North Crawford Avenue, 100 x 125 ft.

The Northern Drop Forge Co., Chicago, is planning for the erection of a new plant at Duke and James streets, to cost about $150,000.

The National Refining Co., Coffeyville, Kan., will build a one-story boiler plant, 75 x 90 ft., to cost about $75,000, including equipment. S. A. White is local manager.

The Sioux City Casket Co., 900 Fifth Street, Sioux City, Iowa, has completed plans for a new three-story, reinforced-concrete plant, 135 x 135 ft., at Fourth and Prospect streets, to cost about $200,000.

The Gartland, McCarthy Foundry Co., 3425 South Lawndale Avenue, Chicago, has awarded a contract to the Austin Co., 208 South La Salle Street, for the erection of a one-story plant, 100 x 300 ft., to cost about $300,000, including equipment.

Cleveland

CLEVELAND, April 12.

Machine tool business came out in heavy volume the past week as a result of the closing of contracts on lists which have been pending several weeks. Single machines were also in good demand. A disquieting factor in the market was the cancellation of a round lot of equipment by a large local manufacturer in the automotive industry, the reason given being that the company will not have its extensions completed as soon as expected. One local machine tool manufacturer definitely closed for 30 turret lathes for Russia, for which it entered into negotiations a few weeks ago, but will do nothing about filling the order until the United States takes steps toward establishing commercial relations with the Soviet Government.

Some easing up in the machinery situation is noticeable inasmuch as better deliveries can be secured than a few weeks ago on certain machines. On the other hand some manufacturers are getting further behind and have ceased fixing delivery dates or are making very indefinite promises and one or two makers have advised customers of their willingness to accept cancellations. The inability of manufacturers to keep up to delivery schedules is due largely to delays in securing castings.

A local machine tool manufacturer received orders the past week for 25 machines for the Ford tractor plant at Hamilton, Ohio, in addition to considerable equipment placed recently for this plant. Other orders for turret lathes in-

...de one for five machines for the Akron plant of the International Harvester Co., seven for the Remington plant of the General Electric Co., and four for the Hoover Suction Sweeper Co., North Canton, Ohio. An order for two turret lathes was placed by the Federal Shipbuilding Co., Kearny, N. J., and the Merchant Shipbuilding Co., Chester, Pa., purchased one large turret lathe. Other turret lathe orders included three for Japan, one for the Maine Central Railroad and three for the Goodyear Tire & Rubber Co., Akron. The Nickel Plate Railroad the past week purchased a portion of the machinery in its recent list. Considerable equipment is being purchased by tire manufacturers in Akron, who placed orders for a number of boring mills the past week. The Parish-Bingham Co., Cleveland, bought four hand screw machines, and the Clay Engine Co., Cleveland, several machines.

The Cleveland Electric Mono-rail Co. will erect a plant in Wickliffe, Ohio, for the manufacture of overhead carrying systems, and will shortly line up its machinery requirements, which are being looked after by E. T. Bennington, 11802 Tuscora Avenue, Cleveland.

The Superior Tractor Co., Cleveland, has purchased a 20-acre site at St. Clair Avenue and East 200th Street on which it will erect a plant shortly for the manufacture of a four-wheel drive tractor. Among those interested are W. D. Sayle of the Cleveland Punch & Shear Co., E. A. Noll of the National Tool Co., and J. C. Lincoln, Lincoln Electric Co.

The Thomart Motor Co. has been organized by Akron, Ohio, men and will establish a plant for the manufacture of motor trucks. It has acquired the works formerly occupied by the Seneca Chain Co. in Kent, Ohio. W. G. Thompson is president and B. S. Schriber, secretary and treasurer. The captial stock will be $5,000,000.

The Medina Machine Co., Medina, Ohio, has been reorganized as the Medina Mfg. Co., and the capital stock increased from $75,000 to $1,000,000. The company plans extensions which will more than double its present capacity and in addition to its other products will manufacture spot lights for automobiles. W. E. Griesinger is president; R. D. Fildes, general manager, and J. E. Thatcher, secretary. The officers are the same as under the old organization.

The Ravenna Furnace & Heating Co., Ravenna, Ohio, will enlarge its plant by erecting an extension to its foundry and an additional building, 64 x 80 ft.

The Deibold Safe & Lock Co., Canton, Ohio, will erect an addition, 152 x 218 ft., at an estimated cost of $95,000.

The Vi Brass & Aluminum Co., operating a brass and aluminum foundry in Bryan, Ohio, will establish a plant in Massillon, Ohio. C. H. Noll is president.

The Detroit Tool Co., Detroit, has commenced the erection of a two-story brick building, 120 x 120 ft., which will provide additional manufacturing space and office room.

The General Metals Co., Detroit, has increased its capital stock from $100,000 to $250,000 to provide for expansion.

The Joseph L. Skeldon Machinery Co., Toledo, Ohio, has been awarded contract for erecting a new steam plant for the Dover, Ohio, municipal light and power plant on a bid of $100,000.

Clifford H. Peters has opened an office at 226 Superior Avenue West, Cleveland, and will engage in drafting and designing of machines and mechanical equipment, tools, dies and fixtures. He is also prepared to give engineering service embracing plant layout, production systems and cost accounting. Another feature of his service includes the design, construction, testing and development of special and experimental appliances, automatic and semi-automatic machines.

Pittsburgh

PITTSBURGH, April 12.

The McKenna Brass & Mfg. Co., Bass and Water streets, Pittsburgh, has completed plans for a brick and concrete machine shop addition to cost about $150,000, including equipment.

The Cambria Steel Co., Johnstown, Pa., has completed plans for a one-story shop addition, of brick and steel, 60 x 250 ft.

The S. Obermayer Co., Pittsburgh, manufacturer of foundry equipment and supplies, has leased the building, 96 x 120 ft., at 2835-39 Smallman Street, for its local works. The company maintains headquarters at Chicago.

The Twin Valley Motor Corporation, Dibert Street, Johnstown, Pa., has completed plans for a two-story service building and repair works, 210 x 220 ft., at 218 Main Street, to cost about $130,000, including equipment.

The Wappat Gear Works, Pittsburgh, manufacturer of machine parts, gears, etc., has arranged for increased capacity at its new works, Mead and Braddock avenues. The plant is 80 x 100 ft., with site 100 x 140 ft. F. W. Wappat is president and general manager.

The American Steel Foundries, Inc., 30 Church Street, New York, will resume operations at its plant at Franklin, Pa., which has been idle for many months. Employment will be given to about 400.

The Atco Spark Plug & Mfg. Co., Pittsburgh, has been incorporated in Delaware with capital of $300,000 by George B. Atwater, Pittsburgh; H. Wallace Fisher and Jabez Law, McKeesport, Pa., to manufacture spark plugs and ignition equipment.

The Keeley Stove Co., Columbia, Pa., is having plans prepared for a four-story building, 25 x 30 ft., to cost about $15,000.

The Beaver Valley Alloy Foundry Co., Rochester, Pa., has been incorporated with a capital stock of $30,000 to manufacture metal alloy castings. Charles E. Coleman is treasurer.

The Sistersville Tank & Boiler Works, Sistersville, W. Va., has awarded a contract to the Moss Iron Works, Wheeling W. Va., for the erection of a one-story addition, 95 x 150 ft.

The Chesapeake & Ohio Railroad, Richmond, Va., is considering the erection of new repair shops, engine house and mechanical buildings at Danville, W. Va., to cost in excess of $500,000, including equipment. F. I. Cabell is chief engineer.

The Thomas Coal Co., Bramwell, W. Va., is planning for the erection of a coal tipple and washing plant to cost about $100,000.

Cincinnati

CINCINNATI, April 12.

Inquiries for machine tools for export continue in fairly good volume and a very satisfactory business is being done, particularly with South America and Japan. An encouraging feature the past week was the receipt of orders for radial and upright drills from France, Spain and Italy. Inquiries are also coming from England, and manufacturers are of the opinion that should exchange conditions show any improvement heavy buying will result from European countries. The domestic market shows improvement and orders are being booked from all sections of the country. The mining machinery market is exceptionally active and automobile manufacturers have also been good buyers. Orders for single machines have been received from several railroads, but with the exception of the Chicago, Burlington & Quincy list, inquiry has not been heavy.

The Shepard Lathe Co., Canal and Jackson streets, Cincinnati, has been incorporated with a capitalization of $150,000. It is contemplating extensions to its plant to take care of increasing business, but no definite plans have been completed.

The Metzger Welding Co., Cincinnati, has increased its capital stock from $10,000 to $50,000 and has recently moved into larger quarters at the corner of Powers Street and Colerain Avenue. In addition to welding it has recently commenced the manufacture of spring bolts, shackle bolts, tie rods, etc. G. D. Metzger is president.

The Wright Traffic Signal Co., Cincinnati, has been incorporated with a capital stock of $100,000 and will conduct a general manufacturing business, including as a specialty the manufacture of traffic signals. It is operating at 844 West Sixth Street. T. B. Wright is president.

The Willard-Middletown Machine Co., Cincinnati, has recently increased its capital stock from $1,000 to $200,000. No definite plans have been announced.

Bids will be received at Columbus, Ohio, until April 20 for the construction of a machine shop at Pearl and Engler streets, for the commissioners of Franklin County, at a cost of about $15,000. William Tremaine is the architect.

The Buckeye Boiler Co., Dayton, Ohio, has purchased property at St. Paul and Hamilton avenues. It is understood that the property was taken over in anticipation of future expansion but no improvement will be made in the immediate future.

The Fairbanks Steam Shovel Co., Marion, Ohio, has increased its capital stock from $400,000 to $500,000 to take care of increased business.

The Pandora Mfg. Co., Columbus, Ohio, has been incorporated with a capital stock of $100,000 by A. E. Krauss, A. W. Duff, G. M. Cotter, A. S. Barnes and H. A. Heffer. It will manufacture sanitary cement.

The Columbus Pattern & Mfg Co., Columbus, Ohio, has been incorporated by A. F. Wise, J. F. Yoakum, W. D. Jones and H. R. Gill with a capital stock of $25,000. It will operate a pattern shop and it is understood will eventually manufacture small castings.

The G. A. Gray Co., Cincinnati, manufacturer of the Gray planers, has purchased land in the Norwood section and will eventually move its plant from its present location. It is reported that the price paid for the property was approximately $70,000.

Plans for the proposed addition to the plant of the Karl Kiefer Machine Co., 919 Martin Street, Cincinnati, will be prepared by the Reliance Engineering Co., Fourth National Bank Building. The structure will be two stories, of brick and reinforced concrete, 50 x 150 ft.

The Dover Mfg. Co., Dover, Ohio, manufacturer of electric and sad irons, is having plans prepared for a three-store addition, 80 x 200 ft.

The Elmwood Casting Co., St. Bernard, Ohio, is having plans prepared by the Frank D. Chase Co., 122 South Michigan Avenue, Chicago, for rebuilding its plant on Murray Road, recently destroyed by fire. The new works are estimated to cost about $200,000.

H. Gerstner & Sons, Cincinnati Street, Dayton, Ohio, manufacturers of tools, etc., are planning for the erection of a three-story addition, 40 x 80 ft., at Columbia and Cincinnati streets, to cost about $25,000.

Indianapolis

INDIANAPOLIS, April 12.

The Studebaker Corporation, South Bend, Ind., manufacturer of automobiles, is planning for the early occupancy of several new plant units now in course of erection, which include a four-story, reinforced-concrete structure, 192 x 528 ft., for assembling and sub-assembling work, comprising tool departments, machinery maintenance and repair works, storerooms and other mechanical departments. A one-story, steel frame building, 183 x 528 ft., will be equipped as a stamping department and for enameling operations. Other buildings are a one-story machine shop, 425 x 576 ft.; forge shop, 161 x 742 ft., and electric power plant. The total area of the new buildings is 1,206,800 sq. ft.

Fire, March 31, destroyed a portion of the plant of the Indiana Refining Co., South Bend, Ind., with loss estimated at $100,000.

The Craig Hunt Motors Co., 9 North Illinois Street, Indianapolis, is having plans prepared for a new plant at Thirty-eighth and Meridian streets, to cost about $300,000, including equipment. It will be used for the manufacture of automobile motors.

The Liquid Carbonic Co., Evansville, Ind., manufacturer of soda fountain equipment, has completed plans for a two-story plant, 80 x 150 ft., to cost about $50,000.

The General Tool & Gauge Co., Indianapolis, has increased its capital stock from $20,000 to $100,000.

The Modern Way Furnace Co., Fort Wayne, Ind., has increased its capital stock from $10,000 to $50,000.

The Hartford Foundry & Machine Co., Hartford City, Ind., has been incorporated by J. Cloyd Miller, William F. Lange and Luther P. Young.

The Griffith Foundry Co., Griffith, Ind., has increased its capital stock from $50,000 to $150,000.

The Ledhercamp Mfg. Co., New Albany, Ind., has been incorporated with $10,000 capital stock to manufacture steel novelties. The directors are F. A. Ledward, C. T. Hertzsch and S. D. Camper.

The Indiana Metal Products Co., Muncie, Ind., has been incorporated with $25,000 capital stock to manufacture metal products. The directors are Ellsworth G. Jarrell, Harry Yep and E. L. Yeo.

The American Auto Top Co., Delphi, Ind., has been incorporated with $200,000 capital stock to manufacture automobile tops and accessories. The directors are James A. Shirk, James C. Smock and Leander D. Boyd.

The Blackhawk Tire & Rubber Co., Warsaw, Ind., has been incorporated with $300,000 capital stock to manufacture automobile tires and accessories. The directors are W. J. Hubert, J. O. Zimmer and George Franklin.

The McGill Mfg. Co., manufacturer of lamp guards, electric pull chain sockets, etc., Valparaiso, Ind., has let contract for the construction of two buildings on the north end of Campbell Street, 104 x 206 ft. and 52 x 78 ft. The larger structure will house a machine shop.

The Waage Electric Co., 12 South Jefferson Street, Chicago, has leased part of the Michigan City Ice & Cold Storage Co. property, at Michigan City, Ind., for nickel plating work.

Detroit

DETROIT, April 12.

The Detroit Weatherproof Body Co., Pontiac, Mich., manufacturer of automobile bodies, has awarded a contract to Grotton Brothers, Lansing, Mich., for the erection of a three-story and basement plant, 70 x 150 ft., at Corunna, Mich.

The General Aluminum & Brass Mfg. Co., East Grand Boulevard, Detroit, has arranged for a stock issue of $1,000,000, for increased manufacturing facilities and working capital. The company specializes in the manufacture of bronze back babbitt lined bearings, aluminum castings and similar specialties for automobile service. F. C. Root is president.

The Detroit Pressed Steel Co., 1800 Mount Elliott Avenue, Detroit, has taken bids for the erection of a one-story, brick and steel addition, 175 x 280 ft., at Mount Elliott and Strong avenues.

The General Forging Corporation, Detroit, has been incorporated with a capital stock of $4,400,000 under Delaware laws by J. D. Edmonds, A. W. Craig and H. N. Spranger, to manufacture drop forgings and other iron and steel products.

The McCord Mfg. Co., Detroit, manufacturer of radiators for automobiles, gaskets for motors, etc., has arranged for a stock issue aggregating $1,075,000. It also operates the plants of the Racine Mfg. Co., Racine, Wis., and the Russel Motor Axle Co., Wyandotte, Mich. A. C. McCord is president.

The Superior Machine & Engineering Co., 51 East Fourth Street, Detroit, has taken bids for a three-story plant, 100 x 120 ft., at East Larned and St. Aubin streets, to cost about $100,000.

The Board of Works, Lansing, Mich, is having plans prepared for a one-story municipal electric power plant, to cost about $1,000,000 including machinery. O. E. Eckhart, City Hall, is city engineer.

The Columbia Motors Co., East Jefferson Street, Detroit, manufacturer of automobile motors, has increased its capital stock to $6,000,000.

The Peck Iron & Steel Works, Kalamazoo, Mich., has increased its capital stock from $30,000 to $60,000 and has purchased the plant of the Vicksburg Governor Co., Vicksburg, Mich.

The Central South

LOUISVILLE, April 12.

The United Casket Co., Kentucky Title Building, Louisville, is taking bids for a one-story and basement plant, 100 x 450 ft., on Twelfth Street, to cost about $300,000, including equipment. A boiler plant will also be erected. Gerard Zimmerman is president.

The Dow Wire & Iron Works, Louisville, has increased its capital stock to $500,000.

The Kentucky Tire & Rubber Co., 502 Realty Building, Louisville, manufacturer of automobile tires, is having plans prepared for rebuilding its plant, recently destroyed by fire. It will be one story, 50 x 470 ft., and is estimated to cost about $250,000, including equipment. W. R. White is president.

The Dixie Brass & Foundry Co., Birmingham, Ala., is planning for the erection of a machine shop on Sixth Avenue, near Twelfth Street, to cost about $50,000. It recently increased its capital stock from $15,000 to $100,000.

The Associated Producing & Refining Co., Shreveport, La., has acquired about 35 acres as a site for the erection of a new refinery to cost about $100,000.

The Kanawha-Elkhorn Collieries Co., Praise, Ky., is planning for the installation of new electrical equipment at its plant, including generators, etc. R. C. Simpson is general superintendent. Headquarters of the company are at 217 Ellicott Square, Buffalo, N. Y.

The Acme By-Products Coal Co., Fleming, Ky., is planning for the erection of a new coal tipple at Sergent, Ky.

The Mutual Oil & Refining Co., Security Trust Building, Winchester, Ky., has perfected plans for the erection of a new refinery with a daily capacity of about 500 bbl.

The Chattanooga Implement & Mfg. Co., Chattanooga, Tenn., has increased its capital stock to $300,000.

J. N. Roberts, New Albany, Ind., who recently purchased a 10-acre site for veneer mills, is in the market for rotary and slicing veneer machines, motors, boiler, etc.

On April 26 a special meeting of the stockholders of B. F. Avery & Sons, Louisville, will be held to consider plans for an increase of $4,400,000 in stock, to be used in doubling

the capacity of the present plant. It manufactures a general line of implements.

The Strube Garage Co., 432 East Broadway, Louisville, has let contract to the George H. Rommell Co. for a garage at 907 East Broadway, to cost $26,000. A machine shop will be equipped.

The John D. Rommel Co. has purchased a site at 966 South Third Street and will let contract for a garage, to cost $40,000, including equipment.

Texas

AUSTIN, April 10.

The Beaumont Iron Works, Beaumont, has increased its capital stock from $225,000 to $700,000. The additional funds will be used to treble the capacity of its plant, which is devoted to the manufacture of oil well machinery. L. J. Black, Beaumont, is president.

The Armstrong Farm Tractor Co., Cisco, which has a captital stock of $200,000, will build a plant for the manufacture of tractors. A. Browning is representing the company in the preliminary arrangements.

The Acme Brick Co., Fort Worth, has increased its capital stock from $700,000 to $1,500,000 and will enlarge its plant.

The Alvin Ice, Light & Power Co., Alvin, will install equipment for the manufacture of ice.

James Price, Torreon, Mexico, and associates have under consideration plans for the construction of a cotton mill at Three Rivers, Tex. Col. Charles Tips, 609 National Bank of Commerce Building, San Antonio, is interested.

The Magnolia Petroleum Co., with principal office at Galveston, will build a refinery about three miles north of Port Neches. It is now enlarging its refinery at Beaumont.

The Merchants' Produce Co., Amarillo, will build a cold storage plant to cost with equipment more than $200,000.

The Simple Auto Rim Co., Dallas, Tex., is having plans prepared for a new brick and concrete plant to cost about $200,000, including equipment. W. H. McCullough, 1711 West Avenue, Waco, Tex., is engineer.

The Hydraulic Machinery Mfg. Co., Port Neches, Tex., has been incorporated with a capital stock of $250,000 by C. F. Holmes, A. H. Dewer and R. C. Cogburn, to manufacture special machinery.

The Henderson Cotton Oil & Gin Co., Henderson, Tex., is arranging for the erection of an electric power plant for works service.

The D. June Machinery Co., Waco, Tex., has increased its capital stock from $100,000 to $150,000.

Several buildings, including engine plant, shops and unloading sheds, at the Government aviation repair plant, near Dallas, were destroyed by fire, April 8, with loss estimated in excess of $500,000.

The Silvers Box Corporation, 317 Bourbon Street, Dallas, is having plans prepared for a new plant at Clarence and Latimore streets to comprise six one-story units, each 60 x 200 ft., to cost $250,000.

The Longhorn Refining Co., Cameron, Tex., is planning for the erection of a new refinery, with a daily capacity of about 2000 bbl.

The Mogul Producing & Refining Co., Orange, Tex., is having plans prepared for the erection of a new refinery with a daily capacity of about 5000 bbl.

The Lone Star Bed Co., Logan and Harrsion streets, Dallas, manufacturer of metal beds, is planning for the erection of the first unit of a proposed new works, 75 x 100 ft.

The Simplex Ice Machine Co., Fort Worth, manufacturer of ice and refrigerating machinery, is having plans prepared for a brick and concrete addition to cost about $100,000. W. H. Rathbone is secretary.

The Pacific Northwest

SEATTLE, April 6.

Business in practically all metal-working lines continues in satisfactory volume. Manufacturers generally are operating at capacity, although due to inadequacy of transportation facilities and shortage of labor in certain lines the output is still behind demand and deliveries are hampered.

The Norway Pacific Shipbuilding Co., Everett, Wash., M. G. Thomle, president, has received a contract for constructing five 10,600-ton tank steamers, costing $11,000,000, for Norwegian interests.

The U. S. Macaroni Co., Spokane, plans the erection of a new factory at a cost of $12,000 and the installation of equipment to cost $10,000.

The plant of the Coal Creek Lumber Co., Chehalis, Wash., was recently destroyed by fire with loss of $150,000. C. L. Brown, president, states it will be rebuilt.

The Oregon Mirror & Beveling Works, Portland, will remove its plant to another location, where new equipment and machinery will be installed to double the output and add other lines of manufacture.

The Great Northern Railroad, St. Paul, Minn., will erect at Whitefish, Mont., shops with space for the accommodation of 10 locomotives, and will install machinery for repair work.

The Colburn Mfg. Co., Spokane, Wash., has been incorporated with $10,000 capital stock and will manufacture toys, camp utensils and wooden products. The incorporators are A. O., B. O. Colburn and E. A. Child.

The plant of the Donovan-Dubois Lumber Co., Stevenson, Wash., is being overhauled and new equipment installed for a daily capacity of 60,000 ft.

The Red Cedar Lumber Co., Vancouver, B. C., plans the construction of a shingle mill and dry kiln to cost $80,000.

The Majestic Furnace Mfg. Co., Seattle, has leased a new structure which it will equip for the manufacture of pipeless furnaces.

Milwaukee

MILWAUKEE, April 12.

The first ten days of April have developed an excellent business, principally in single tools, with a sprinkling of small lots, but an absence of orders of any considerable size individually. Shops are sold up until after July 1 and in some cases are quoting ahead as far as Sept. 1. Deliveries are beginning to feel the adverse effect of the switchmen's strike at Chicago, which was extended to Milwaukee Saturday.

Fairbanks, Morse & Co., Chicago, broke ground during the past week for a new gray iron foundry and auxiliary buildings which will cost approximately $2,000,000. The main building will be 455 x 550 ft., of brick and steel, containing four cupolas. Plans provide for the erection of a duplicate unit when necessary.

The Allis-Chalmers Mfg. Co., Milwaukee, is starting work on the superstructure of a new gray iron foundry, 135 x 550 ft., foundations for which were laid during the winter. It will be used largely to supply castings to the tractor department.

Spiering & Remmel, New London, Wis., opened a new machine shop and general repair works in the Schwebs Building, Hortonville, Wis., on April 5.

The Railway Materials Co., with works at Toledo, Ohio, Phoenixville, Pa., and Stevens Point, Wis., is doubling the size of its working force at Stevens Point to relieve the congestion of orders at the Eastern shops. It manufactures brake shoes and most of the output at Stevens Point is absorbed by the Soo Line, Wisconsin division.

The William Loeffler Machine Co., Sheboygan, Wis., is incorporating as the Loeffler Machine Co., with a capital stock of $100,000 and will start work about May 1 on the erection of a gray iron foundry, 80 x 132 ft., and a machine shop addition, 40 x 100 ft. It specializes in sanding drums, chair irons and other machinery and supplies for the furniture industry. William Loeffler, Sr., and his sons, Alvin and William Loeffler, Jr., are the principal owners.

The Instant Heat Co., Appleton, Wis., a new $150,000 corporation organized to manufacture patented aluminum bottles and other containers, has acquired one of the buildings of the Appleton Brewing & Malt Co. at Lake and South River streets, which will be converted into a foundry and machine shop. Orders have been placed for the bulk of the machinery and other equipment. A. Archibald is president and general manager.

The J. I. Case Threshing Machine Co., Racine, Wis., has purchased the gray iron foundry erected in 1918 at Sixty-fourth Avenue and the Milwaukee road tracks in West Allis by the Universal Machinery Co., Milwaukee. The shop will be conducted under the name of Lake Motor Co. The Universal company also has sold its original machine shop at 784-790 Thirtieth Street, Milwaukee, to the Milwaukee Brush Co., 51 Erie Street, which will make alterations and install new equipment.

The Jenkins Machine Co., Sheboygan, Wis., has booked an order to furnish all of the machinery and equipment for a new sash, door and millwork factory to be erected at Rotterdam, Holland, by C. Bruynzeel & Zonen. The order was placed in person by C. Bruynzeel, Jr., who came to the United States with this object. The Jenkins company also is working on contracts of considerable size for woodworking machinery for France, Sweden, Japan, Belgium and England.

The Hayton Pump & Blower Co., Appleton, Wis., is contemplating the erection of additions to its foundry and machine shop as soon as conditions in the building trade and labor supply become more favorable. Tentative plans are under consideration.

The Geuder, Paeschke & Frey Co., Milwaukee, manufacturer of sheet metal products, will build a two-story brick and concrete stamping shop addition, 30 x 75 ft., costing about $20,000 with equipment.

The Burlington Brass Works, Burlington, Wis., has awarded contracts for a one-story brick and concrete brass foundry addition, 100 x 140 ft., designed by Edmund B. Funston & Co., architects, Racine, Wis. The investment in building and equipment will be about $112,000. C. Roy McCanna is president.

The Sterling Engineering Co., 419 Third Street, Milwaukee, manufacturer of heating specialties, has increased its capital stock from $15,000 to $30,000 and will purchase additional equipment to increase its capacity about 50 per cent. Clarence J. Rice is president.

The Vincent-Alward Co., Kenosha, Wis., manufacturer of bedsprings, has changed its corporate style to Vincent-McCall Co. V. L. Alward, one of the founders of the business, has retired and his interest is taken over by A. B. McCall. W. W. Vincent is president and general manager.

The Bernert Mfg. Co., 489 Twelfth Street, Milwaukee, manufacturer of pneumatic grain conveyors and other mill and elevator equipment, has engaged Joseph Glaser, architect, 731 Caswell Block, to design a new plant, 120 x 260 ft., consisting of foundry, machine shop and boiler room. Bids will be taken about April 24. The Bernert company is capitalized at $1,000,000. George F. Bernert is president and chief engineer.

The Acme Motor Parts Corporation, 355 East Water Street, Milwaukee, has increased its capital stock from $50,000 to $100,000 and will enlarge its shop by installing additional machinery.

The Turner Mfg. Co., Port Washington, Wis., is taking steps preliminary to the erection of additions to its gray iron foundry and machine shop by constructing a sea-wall which will provide a site for a building of 50,000 sq. ft. The plant has been operated night and day for more than two months to handle increasing orders for tractors and gas engines. Francis Bloodgood, Jr., Milwaukee, has been elected president, succeeding F. M. Smith.

The Interlake Pulp & Paper Co., Appleton, Wis., has plans for a two-story brick addition, 70 x 140 ft., to be equipped to manufacture and repair machinery, tanks, etc., for its own purposes.

The Manufacturers Hardware Corporation, 491 Broadway, Milwaukee, has awarded contracts for the erection of the first unit of a new plant at Twenty-third and Clybourn streets. The first building will be of brick, 50 x 75 ft., one story. H. T. Liebert, 425 East Water Street, is the architect.

The Lawson Aircraft Co., South Milwaukee, Wis., is taking bids for the erection of a one-story assembling shop, 72 x 160 ft., of brick and concrete. Alfred W. Lawson is vice-president and chief engineer.

The Frint Motor Car Co., 209-211 Wisconsin Street, Milwaukee, has engaged Armand D. Koch, architect, 1045 Wells Building, to design a three-story sales and service building, costing $125,000, to be erected on Jackson Street, between Oneida and Mason streets.

The American Axle Co., Chicago, has selected Barton, Wis., as the site for a new plant and is taking bids for the erection of a one-story brick, steel and concrete machine and assembling shop, 100 x 600 ft. It manufactures worm-drive axles for motor cars and trucks. Peter C. Wolf is in charge of the Barton operation.

The Bain Wagon Co., Kenosha, Wis., has increased its authorized capital stock from $400,000 to $1,200,000, the new issue being absorbed by present stockholders. It is reported that the company is preparing to enter the motor truck and trailer industry, but confirmation is lacking. George A. Yule is president.

The All-Tite Chain Co., 229 Twenty-seventh Street, Milwaukee, will erect its proposed new factory at Cedarburg, Wis., and has engaged F. W. Andree, architect, 739 Thirty-fourth Street, to prepare plans for a one-story building, 45 x 122 ft., costing about $20,000 with machinery.

The Automotive Foundry Co., La Crosse, Wis., is erecting a brick and steel gray iron shop, 100 x 220 ft., which will be ready for operation about June 1. It is incorporated for $100,000 and will furnish castings to the La Crosse Tractor Co. and other local and outside industries. A. A. Rasmussen is works manager.

The Hoskins-Morainville Paper Co., Menominee, Mich., has let the general contract to H. J. Selmer, Green Bay, Wis., for a paper mill, consisting of a main buliding, 80 x 652 ft., boiler house, power plant and 200-ft. concrete stack. With equipment it will cost about $875,000.

The Board of Public Works, La Crosse, Wis., is asking bids until May 12 for the erection of a junior high and vocational training school, estimated to cost $135,000. The architects are Parkinson & Dockdorff, local.

The Lloyd Mfg. Co., Menominee, Mich., manufacturer of machinery for weaving reed containers and furniture, is asking estimates on tentative plans for a three-story plant, 100 x 400 ft., which it contemplates establishing in London, England.

California

SAN FRANCISCO, April 6.

The Apex Appliance Co., 1723 Broadway, Oakland, Cal., manufacturer of electric washing machines, is having plans prepared at its Chicago office for a one-story, reinforced concrete plant on local site, to cost about $60,000.

The Pacific Automotive Co., Los Angeles, has been incorporated with a capital stock of $500,000 by W. F. Holt, B. F. Coons, F. O. Meyers and George H. Woodruff to manufacture automobile motors.

The Board of Education, Glendale, Cal., will build a new two-story manual training school on Broadway, with mechanical departments, to cost about $80,000.

The Pasadena Foundry Co., Raymond Avenue and Ritzman Street, Pasadena, Cal., has filed notice of organization to manufacture iron and other metal castings. John M. Miller, 145 Gertrude Court, heads the company.

The Pacific Fruit Express Co., 65 Market Street, San Francisco, a subsidiary of the Southern Pacific Railroad, is planning for additions and improvements in its icing and pre-cooling plants at different locations, to cost about $1,500,000, including equipment. The work includes the conversion of several plants from steam to electric operation, and the erection of new cold storage plants. C. M. Secrist is vice-president and general manager.

The Johnson Electric Washer Co., Emeryville, Oakland, Cal., has completed plans for the erection of a one-story plant, 120 x 135 ft., at Fortieth and Adeline streets, to cost about $40,000.

The Adjustable & Reversible Propeller Corporation, Los Angeles, has been incorporated in Delaware with a capital stock of $1,000,000 by Seth Hark, Robert J. Eustis and W. D. Longyear, Los Angeles, to manufacture aircraft equipment.

The Sunset Spring Co., Los Angeles, has been incorporated with a capital stock of $50,000 by George S. Patterson, South Pasadena; Anthony Marshall, Pasadena, and Ray L. Chesebro, Los Angeles, to manufacture springs, shock absorbers and similar products.

The Edison Electric Appliance Co., Ontario, Cal., will erect a one-story addition to cost about $16,000.

The Standard Brass Casting Co., Oakland, Cal., has filed plans for a one-story brick addition at Third and Jefferson streets.

Canada

TORONTO, April 12.

The Carborundum Co., Niagara Falls, N. Y., will spend approximately $500,000 in extending its local plant and its furnaces at Niagara Falls, Ont., and Shawingan Falls, Que. Work will begin at once.

Bearing Metals, Ltd., recently incorporated with offices in room 316, Dominion Express Building, Montreal, has acquired the plant of the Lion Metal Co., Cote St. Paul, Que., and will manufacture babbitt metal, solder, etc. E. L. W. Saunderson, formerly manager of the Magnolia Metal Co., will be in charge.

Richard Hart, Brantford, Ont., will erect a brick brass foundry at 22 Leonard Street, 20 x 36 ft.

The Dominion Welding Mfg. Co., 584 St. Timothee Street, Montreal, has acquired the plant of the Belanger Foundry Co., 340 Amherst Street, which it will occupy immediately. The company will manufacture instantaneous water heaters and will also continue general welding work.

The Draper Mfg. Co., Petrolea, Ont., will lease a factory and install machinery for the manufacture of brass valves, etc.

The Regal Tire & Rubber Co., Sherbrooke, Que., will remodel an existing building and install equipment for manufacturing purposes. Robert W. Hogg is secretary-treasurer.

The Canadian Tygard Engine Co. will build a carburetor plant in Toronto to cost $40,000. H. R. Watson, 907 Excelsior Life Building, is the architect.

The Steel Co. of Canada, Hamilton, Ont., is in the market

for an automatic wire straightener and cutting machine, to cut 40 ft. and shorter and ⅝-in. round and smaller.

The Hull Iron & Steel Works, Hull, Que., is having plans prepared by Millson & Burgess, 209 Sparks Street, Ottawa, Ont., for the erection of a foundry.

E. H. Darling, consulting engineer, Spectator Building, Hamilton, Ont., is asking for prices on a 100 gal. per min. pump, also deep well pump for Fergus, Ont.

The Wallace Shipyards, Ltd., Vancouver, B. C., is having plans prepared for a floating dry dock to cost $400,000.

The Canadian Raybestos Co., Bridgeport, Conn., has purchased a building at Peterboro, Ont., which it will remodel and equip for the manufacture of its products.

The Canadian General Electric Co., 212 King Street West, Toronto, will erect an addition to its plant at Peterboro and install equipment at a total cost of $500,000.

The Universal Car Agency, Chatham and Pelessier streets, Windsor, Ont., is having plans prepared by J. C. Pennington, LaBelle Building, for the erection of a garage to cost $75,000.

The Standard Tube & Fence Co., Hunter Street, Woodstock, Ont., will build an addition to its plant to cost $30,000. W. Moore is manager.

Contracts have been awarded and construction will start immediately on an addition to the plant of the Canadian Laundry Machine Co., 47 Sterling Road, Toronto.

The Hayward Lumber Co., 11904 Seventy-third Street, Edmonton, Alta., will shortly receive bids for the erection of a factory to cost $30,000; dry kiln to cost $10,000; and power house, $12,000. E. W. Moorehouse, 11153 Sixty-fourth Street, is the architect.

The Arrow Bedding, Ltd., Toronto, has been incorporated with a capital stock of $60,000 by Henry H. Davis, room 25, 10 Adelaide Street East; John R. Rumball, 65 Charles Street West; Lawrence A. Landriau, and others to manufacture beds, springs, etc.

The Lennard Machine Tool Co., Ltd., Toronto has been incorporated with a capital stock of $40,000 by Henry B. Hudson, Robert E. Grass, 157 Bay Street; Alexander S. Lown, room 12, 26 Adelaide Street West, and others to manufacture machinery, tools, etc.

The Victor Motors, Ltd., Windsor, Ont., has been incorporated with a capital stock of $1,000,000 by Joseph Neff and Louis Genest, both of Detroit, Mich.; Arthur B. Drake, Anson H. Foster and others, Windsor, Ont., to manufacture gasoline engines, motors, parts, machinery, etc.

The plant owned by the Runnymede Brass Foundry, 3360 Dundas Street West, Toronto, was damaged by fire with a loss to building and machinery of $3,000. It will be repaired immediately.

The Oliver Chilled Plow Co., South Bend, Ind., is contemplating the erection of a manufacturing plant in a western Ontario city, details of which are not yet available.

The Canadian Line Materials, Ltd., Hamilton, Ont., has been incorporated with a capital stock of $200,000 by Thomas H. Barnard, John L. Counsell, Ralph R. Bruce and others to manufacture electric transmission and electric railroad line materials, forgings, tools, etc.

OFFICE CHANGES

The offices of the Thomas R. Heyward Co., dealer in pig iron, coal and coke, and alloys, have been removed from the First National Bank Building, to the Bowman Building, Ross Street, Pittsburgh.

The offices of the Union Electric Steel Co. have been removed from the Keystone Bank Building, Pittsburgh, to its works at Carnegie, Pa.

The general and Philadelphia district sales offices of the Tacony Steel Co. have removed from the works to the Franklin Bank Building, 1417 Sansom Street, Philadelphia. J. B. Warren, president, and George Satterthwaite, vice-president, together with the other officials of the company, are now making their headquarters at the new address.

The Titusville Forge Co. has established an office in the Union League Building, Los Angeles, Cal.

The Steel & Iron Commerce Co., recently established by Lester P. Lane, has moved its offices to the Grand Central Terminal Building, 70 East Forty-fifth Street, New York. The company is now in process of incorporation. Charles A. Heilman, at one time connected with the Vulcan Steel Products Co. and recently associated in the Pittsburgh district with the Elliot-Fisher Co., has joined the Steel & Iron Commerce Co., in charge of sales.

NEW TRADE PUBLICATIONS

Gear Cutting Machinery.—Gould & Eberhardt, Newark, N. J. Bulletin 45, 32 pages, 9 x 12 in. Concerned with an extensive line of automatic gear cutting machines, explained as particularly designed for intensive production on automotive gears. The machines are illustrated and views of machines engaged in various operations are shown.

Water Heaters, Coolers, Evaporators.—Griscom-Russell Co., 90 West Street, New York. Leaflet 6. Illustrations of the company's water heaters of the open, closed and storage types; oil heaters, oil coolers, evaporators, expansion joints, grease extractors, and steam, oil and air separators.

Plumbing Specialties.—Richmond Foundry & Mfg. Co., Richmond, Va. Booklet. Illustrations with descriptions of plumbing specialties, including such items as trap screw ferrules, drive ferrules, drum traps, brass ferrules, boiler stands, brackets, sink fixtures, cesspools, etc.

Pipe Unions.—Barber Mfg. Co., 20 East Jackson Boulevard, Chicago. Folder. Describes a flange union marketed under the trade name Sealtite, and made with a flexible composition insert. The union, it is explained, is especially prepared to withstand oil, steam, hot water and acids; also it cannot blow out.

Flexible Metal Arm for Light Fixtures.—Breeze Mfg. Co., 250 South Street, Newark, N. J. Folder. Concerned with a flexible metal arm for supporting an electric light fixture, and for use by factories, machine shops, commercial offices, etc.

Cupolas.—Whiting Foundry Equipment Co., Harvey, Ill. Bulletin 152. Lists users of the company's cupolas, the names being listed according to the shell diameter of the cupolas. A list of users of Whiting continuous melting cupolas is included.

Photo-Micrographic Outfit.—Holz & Co., Inc., 17 Madison Avenue, New York. Bulletin 22-23. Illustrates and describes the universal photo-micrographic and macrographic metallographic bench for magnifications from 1 to 3500 diameters, together with apparatus for "selective" vertical illumination.

Steam Purifier.—Tracy Engineering Co., San Francisco, Cal. Catalog 12, with the title, "Dry Steam." Describes a steam purifier for removing water and entrained foreign illustrations are included.

Spring-Fitting Furnaces.—W. S. Rockwell Co., 50 Church Street, New York. Bulletin 212. Illustrates and describes spring-fitting furnaces made in single-chamber, twin-chamber and multi-chamber types.

Drop Forging Equipment and Layout.—W. S. Rockwell Co., 50 Church Street, New York. Bulletin 213. Shows Rockwell economizer forges arranged in connection with other forging equipment to conserve space and increase production.

Sanitary Factory Equipment.—Manufacturing Equipment & Engineering Co., Boston. Four bulletins devoted to all metal sanitary and fireproof equipment for factory, foundry, gymnasium, public buildings, etc. as follows: Bulletin A, sanitary washbowls; bulletin E, metal racks; bulletin F, sanitary drinking fountain, and a bulletin devoted to factory washbowls having a common water supply, common waste and common vent. The bulletins are illustrated.

Graphic Instruments.—Esterline Co., Indianapolis, Ind. Pamphlet with the title "Graphic Instruments in the Field of Transportation." Shows records made by Esterline instruments from a run on a train between Pittsburgh and New York, also views of electric locomotives, electric railway cars and a battleship which are equipped with Esterline graphic instruments.

Steam Tables for Condenser Work.—Wheeler Condenser & Engineering Co., Carteret, N. J. A 32-page booklet with the title "Steam Tables for Condenser Work." This is a fifth edition of this hand book which gives steam tables with pressure below atmosphere expressed in inches of mercury referred to a 30-in. barometer; also includes a discussion of the use of the mercury column, the errors in such measurements and constants for their correction.

Cranes.—Whiting Foundry Equipment Co., Harvey, Ill. Catalog 151, 79 pages, 6 x 9 in. Devoted to an extensive line of cranes which include traveling, handling, gantry, transfer, handpower, jib, pillar, and bracket cranes. The catalog is illustrated.

Current Metal Prices

On Small Lots, from Merchants' Stocks, New York City

The quotations given below are for small lots, as sold from stores in New York City by merchants carrying stocks.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipment in carload lots from mills, these prices are given for their convenience.

On a number of articles the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE under the general headings of "Iron and Steel Markets" and "Metal Markets."

Iron and Soft Steel Bars and Shapes

	Per lb.
Bars:	
Refined iron, base price	5.00c.
Swedish bars, base price	20.00c.
Soft Steel:	
¾ to 1⅞ in., round and square	3.52c. to 5.00c.
1 to 6 in. x ⅜ to 1 in	3.52c. to 5.00c.
1 to 6 in. x ¼ to 5/16	3.62c. to 5.00c.
Rods—⅝ and 11/16	3.57c. to 4.80c.
Bands—1½ to 6 by 3/16 to No. 8	4.22c. to 6.25c.
Hoops	5.57c. to 6.25c.
Shapes:	
Beams and channels—3 to 15 in	3.47c. to 5.00c.
Angles:	
3 in. x ¼ in. and larger	3.47c. to 5.00c.
3 in. x 3/16 in. and ⅛ in	3.72c. to 5.35c.
1½ to 2½ in. x ⅛ in	3.52c. to 5.65c.
1½ to 2¾ in. x 3/16 in. and thicker	3.47c. to 5.60c.
1 to 1¼ in. x 3/16 in	3.52c. to 5.65c.
1 to 1¼ x ⅛ in	3.57c. to 5.70c.
⅞ x ⅞ x ⅛ in	3.62c. to 5.75c.
¾ x ⅛ in.	3.67c. to 5.80c.
⅝ x ⅛ in	4.07c. to 6.60c.
½ x 3/32 in.	5.17c. to 7.30c.
Tees:	
1 x ⅛ in.	3.87c. to 6.00c.
1¼ in. x 1¼ x 3/16 in	3.77c. to 5.90c.
1½ to 2½ x 3/16 in. and thicker	3.57c. to 5.70c.
3 in. and larger	3.52c. to 5.05c.

Merchant Steel

	Per lb.
Tire, 1½ x ½ in. and larger	5.00c.
Toe calk, ½ x ⅜ in. and larger	5.75c. to 6.00c.
Cold-rolled strip (soft and quarter hard)	12c. to 14c.
Open-hearth spring steel	7.00c.
Shafting and Screw Stock:	
Rounds	6.00c. to 7.00c.
Squares, flats and hex	6.50c. to 7.50c.
Standard cast steel, base price	15.00c.
Best cast steel	20.00c. to 24.00c.
Extra best cast steel	25.00c. to 30.00c.

Tank Plates—Steel

	Per lb.
¼ in. and heavier	3.67c. to 5.50c.

Sheets

Blue Annealed

	Per lb.
No. 10	6.62c. to 8.00c.
No. 12	6.67c. to 8.05c.
No. 14	6.72c. to 8.10c.
No. 16	7.82c. to 8.20c.

Box Annealed—Black

	Soft Steel C. R., One Pass, per lb.	Wood's Refined, per lb.
Nos. 18 to 20	7.80c. to 8.80c.	
Nos. 22 and 24	7.85c. to 8.85c.	9.80c.
No. 26	7.90c. to 8.90c.	9.85c.
No. 28	8.00c. to 9.00c.	10.00c.
No. 30	8.10c. to 9.10c.	

No. 28, 36 in. wide, 10c. higher.

Galvanized

	Per lb.
No. 14	8.25c. to 10.00c.
No. 16	8.50c. to 10.25c.
Nos. 18 and 20	8.65c. to 10.40c.
Nos. 22 and 24	8.80c. to 10.55c.
No. 26	8.95c. to 10.70c.
No. 27	9.10c. to 10.85c.
No. 28	9.25c. to 11.00c.
No. 30	9.75c. to 11.50c.

No. 28, 36 in. wide, 20c. higher.

Pipe

Standard—Steel	Blk.	Galv.	*Wrought Iron*	Blk.	Galv.
⅛ in. Butt	—36	—19	¼-1½ in. Butt	—18	+2
¼-3 in. Butt.	—40	—24	2 in. Lap	— 9	+9
3½-6 in. Lap.	—35	—20	2½-6 in. Lap..	—11	+6
7-12 in. Lap..	—25	— 8	7-12 in. Lap...	+ 2	+20

Steel Wire

Base Price* on No. 9 Gage and Coarser	Per lb
Bright basic	8.00c.
Annealed soft	8.00c.
Galvanized annealed	8.50c.
Coppered basic	8.50c.
Tinned soft Bessemer	10.00c.

*Regular extras for lighter gages.

Brass Sheet, Rod, Tube and Wire

BASE PRICE

High Brass Sheet	28¼c. to 29½c.
High Brass Wire	28¼c. to 29½c.
Brass Rod	26¾c. to 29 c.
Brass Tube	42½c. to 44½c.

Copper Sheets

Sheet copper, hot rolled, 24 oz., 29½c. per lb. base.

Cold rolled, 14 oz. and heavier, 2c. per lb. advance over hot rolled.

Tin Plates

Bright Tin		Coke—14x20		
			Primes	Wasters
Grade "AAA" Charcoal 14x20	Grade "A" Charcoal 14x20	80 lb...	10.80	10.55
		90 lb...	10.90	10.65
		100 lb...	11.00	10.75
1C...$15.50	$13.25	IC...	11.25	11.00
1X... 17.75	15.25	IX...	12.25	12.00
1XX... 19.50	17.00	IXX...	13.25	13.00
1XXX... 21.25	18.75	IXXX...	14.25	14.00
1XXXX... 22.75	20.50	IXXXX...	15.25	15.00

Terne Plates

8-lb. Coating 14x20

100 lb.	$9.35
IC	9.50
IX	10.50
Fire door stock	12.75

Tin

Straits pig	65c.
Bar	70c. to 80c.

Copper

Lake ingot	21c. to 22c.
Electrolytic	20c. to 21c.
Casting	19½c. to 20c.

Spelter and Sheet Zinc

Western spelter	10¼c. to 11¼c.
Sheet zinc, No. 9 base, casks	14c. open 14½c.

Lead and Solder*

American pig lead	10¼c. to 11¼c.
Bar lead	11¼c. to 11¾c.
Solder ½ and ½ guaranteed	43c.
No. 1 solder	40c.
Refined solder	36c.

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

Best grade, per lb.	90c.
Commercial grade, per lb.	50c.

Antimony

Asiatic	12¼c. to 12¾c.

Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb.	35c. to 38c.

Old Metals

Difficulty in making shipments has kept the market in an unsettled condition. Dealers generally are not willing to take on large quantities because of the uncertainty of things. Dealers' buying prices are as follows:

	Cents Per lb
Copper, heavy and crucible	16.75
Copper, heavy and wire	16.00
Copper, light and bottoms	14.50
Brass, heavy	10.75
Brass, light	8.00
Heavy machine composition	16.00
No. 1 yellow brass turnings	9.75
No. 1 red brass or composition turnings	12.75
Lead, heavy	7.75
Lead, tea	6.00
Zinc	5.50